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PRINCIPLES AND PRACTICE OF PROGNOSIS, WITH PARTICULAR REFERENCE TO HEART DISEASE

BILLINGS LECTURE

Paul D. White, M.D., Boston

Although the importance of prognosis (preknowledge or forecasting) in medicine was clearly appreciated by Hippocrates, it has progressed very little and very slowly through the many centuries in contrast to the scientific development of etiology, pathology, diagnosis, and treatment. In the Dark and Middle Ages it drifted almost wholly into superstition. It still remains a stepchild in medical advance partly because it is a difficult subject and partly because, for some reason or other, it has rarely been studied scientifically. The few sentences devoted to it in the account of almost any disease or condition in almost all textbooks and papers are little more than a sop to the conscience. In cases of cardiovascular disease, the statement of prognosis often ends with the word "guarded," largely to play safe. Granted that we can not foretell the future with any certainty, I feel sure, nevertheless, that we can do better than we have in the past, or are doing now, by approaching the subject more scientifically and seriously. We have more facts and knowledge on which to base our prognoses than we utilize; we should call more than we do on the laws of chance in both our written opinions of prognosis of any disease and our discussion of the prognosis of any individual case with the patient himself, with his family, or with fellow physicians.

Here and there, however, in the past there have been physicians who have pointed to the importance of developing a more scientific attitude toward prognosis. For example, James Mackenzie, in the third edition of his book entitled "Diseases of the Heart" published in 1913,[1] wrote as follows in chapter 45 entitled "Prognosis": "I am rather afraid that our profession as a body does not recognize sufficiently its responsibility in regard to prognosis. When an individual submits himself for an opinion he does so with such implicit confidence that the verdict given may alter the whole tenor of his life. . . . A serious responsibility is thrown upon every practitioner at times in advising upon certain questions. 'Should a man give up his business?' This is a question on which advice is constantly sought and whether the individual be a statesman or a laborer, the greatest care is necessary in formulating an answer. If a practitioner seeks for guidance in the textbooks he finds merely general views which he cannot apply to the individual case."

The greatest difficulty in prognosis lies in its complication. There are more factors to be taken into consideration, especially in cardiovascular prognosis, than there are in either diagnosis or treatment. These factors are never just the same in any two cases, and so the prognoses listed in books or papers under the various kinds of heart disease are necessarily very rough estimates; the averages actually apply to very few cases. The difficulties in determining the outcome are illustrated in the discussions of prognosis in the sections on vascular hypertension, congenital heart disease, subacute bacterial endocarditis, and other common forms of heart disease in Cecil and Loeb's "Textbook of Medicine." [2] In the fourth edition of "Heart Disease" published in 1951,[3] I combined "prognosis" with "course" because of the difficulty of writing adequately about prognosis as an isolated subject.

There are many factors that combine to form the basis for cardiovascular prognosis in any given case. Thereon rest the foundations of the principles and practice of prognosis that should rightly become, with time, a science rather than an art. I will present 10 factors, although another might well be added representing chance and unexpected circumstances beyond our control or even beyond our knowledge. Often, of course, the experienced physician does, in the course of his career, acquire some considerable skill in prognosis, but this is often hit or miss and without conscious analysis of the separate factors that I will present.

HEREDITY

The first very basic factor in prognosis is heredity. There is no question but that, other things being equal, the person with long-lived ancestors who were resistant

Read before the Section on Internal Medicine at the 102nd Annual Session of the American Medical Association, New York, June 2, 1953.

1. Mackenzie, J.: Diseases of the Heart, New York, Oxford University Press, 1913.
2. Cecil, R. L., and Loeb, R. F.: Textbook of Medicine, ed. 8, Philadelphia, W. B. Saunders Company, 1951, pp. 1076, 1097, and 1110.
3. White, P. D.: Heart Disease, ed. 4, New York, The Macmillan Company, 1951.

to disease or who possessed the ability to withstand disease, whether it involved the heart or affected other body tissues, is more likely to survive a long time with some disorder or to recover from some very serious illness than is another person whose parents, grandparents, or siblings have succumbed early to some disease or have been more seriously disabled by it than would be expected. The more members of the family, immediate or in recent generations, of whom this is true the worse for the patient under consideration. The prognosis in the case of a 40-year-old man with coronary thrombosis is necessarily worse if both parents died from the same disease when they were in their forties or fifties. And, of course, the disease itself is, in the first place, much more likely to strike such a man in youth or middle age than it is a man whose parents remained healthy until advanced old age. The hazard is more than doubled when both parents were so affected at an early age than when the father alone was affected. The maternal inheritance is thought to be more potent than the paternal; perhaps this is so because it is relatively rare for a woman under 50 to have serious coronary atherosclerosis. When she does, it is much more significant than in a man. More studies of this relative sex responsibility are, however, needed for fuller appraisal of prognosis.

In practice, therefore, it is of great importance in the majority of cases for the physician to inquire specifically about the ages and causes of death or important illnesses in parents and siblings and even, on occasion, in grandparents, uncles, aunts, and children. This is frequently not done because of haste or carelessness, but its value should make it a routine procedure, at least in the case of cardiovascular disease.

An unfavorable family history should not depress any given patient; other more favorable factors can come into play to counteract it, including the almost certain new knowledge about the etiology, pathogenesis, and prevention of certain conditions, such as hypertension and coronary atherosclerosis, that is destined to be ours in the future. The application of this new knowledge will doubtless save or prolong many lives that are now seriously threatened and eventually protect at least in part from such diseases young persons who are likely candidates.

AGE AND SEX

Another factor that is related in particular to the patient is his age. Other things being equal, the older the patient after the period of infancy, the worse the prognosis. It must be realized, however, that chronological age is not the same as physical age. This fact must not only be recognized but be acted on in individual cases.

A factor also related to the person himself is his sex. Again, other things being equal, men are more vulnerable and have an earlier and higher mortality than women, particularly from cardiovascular disease. Of my own patients under the age of 50 with serious hypertension and hypertensive heart disease, three-fourths were men. It is, of course, common knowledge that coronary heart disease is, in particular, one of middle-aged men, and in such cases the prognosis, in my experience, has been somewhat worse than in women. Coronary thrombosis affects more than 20 times as many men as women under the age of 40 and about 5 times as many between 40 and 50. In the fifties, the ratio is about two to one, and after 60 the proportion is nearer one to one. Whether or not we may be able to alter this poor prognosis in men with time and trial, it is too early to say. It has been suggested that new therapy with hormones, perhaps combining the favorable effect of estrogen with the favorable effect of androgen, may eventually prove to be helpful. This is, however, still wholly a matter of the future.

TYPE OF DISEASE

The type of heart disease is, of course, of paramount importance, but happily in some types the picture has changed since a generation ago. At that time two kinds in particular had very bad prognoses. The worst was, of course, subacute bacterial endocarditis; it was about 99.9% fatal prior to 1944, but now it is better than 80% curable in efficient hands. It should be better than that eventually. The change that has come in our experience with subacute bacterial endocarditis can justifiably encourage us about other diseases that still carry bad prognoses.

The other serious type of cardiovascular disease that used to plague us was syphilitic aortitis. By the time an aortic aneurysm was large enough to be diagnosed or aortic regurgitation with an enlarging heart was found, the prognosis was already bad for any long survival; there were but a few months to a few years at most ahead. Now, of course, penicillin can check the progress of such conditions, except when far advanced, and cardiovascular syphilis itself is rapidly becoming history both because of the reduction of prevalence of the original lesion and because of its curability in either primary or secondary phases.

Congenital defects of the heart and the aorta still remain a baffling problem in many instances, with early death in infancy of some of the more intractable lesions. The horizon has greatly brightened, however, for thousands of persons with defects that now can be cured, in particular those with patency of the ductus arteriosus, uncomplicated pulmonary valve stenosis, or coarctation of the aorta, and for many others who can be helped although not cured, in particular the blue babies with the tetralogy of Fallot. Except for rare combinations of anomalies of other sorts, a large number of persons with atrial and ventricular septal defects remain to be helped. The former defects are already being operated on successfully, and it should not be too long before the latter also are helped by the skill of the cardiac surgery of the day.

The prognosis of rheumatic heart disease varies tremendously according to the severity of the initial myocardial involvement, the amount of valvular deformity, and the hazard of recurrent rheumatic activity. There has been, however, a considerable amelioration of these three factors, largely because of the prophylactic use of penicillin and, in fulminating cases, the apparent lifesaving effect of the hormones (cortisone and corticotropin), the successful reapplication of plastic surgery of the badly stenosed mitral valve, and the more scientific appraisal of the physical fitness of the patients. Now rheumatic scarring of the aortic valve is also being

attacked surgically, and it seems quite conceivable that within a few years the damaged aortic valve itself can be improved or that a plastic valve can be introduced to correct the leak in regurgitation. It behooves all of us who have been following congenital or rheumatic heart cripples for years to see them again or send them to others for a new appraisal since a number of them can certainly be helped by present day surgery.

Another kind of heart disease that, although not common a generation ago, was often serious with bad prognosis is the thyrotoxic heart. Atrial fibrillation, generalized enlargement, and congestive failure frequently threatened life. Then came early surgery with subtotal thyroidectomy that, though often hazardous, did save lives. The prognosis today of thyrotoxic heart disease has improved so much that it is a very rare case indeed that cannot be helped to live at least a few years longer, not so much because of the advance in surgical therapy that can be applied but because of current medical treatment of the thyrotoxicosis itself added to ordinary measures for the control of the arrhythmia and congestive failure that are characteristic of advanced cases. Much more important, however, than this treatment of thyrotoxic heart disease is the remarkable reduction in prevalence of thyrotoxicosis as the result of its early recognition and cure, whether surgical or medical, before the heart becomes seriously involved.

In comparison to the kinds of heart disease presented above, in which the prognosis has been considerably improved of late years, there remain three types that continue to challenge us and for which we can, as yet, do little to better the prognosis. The first of these, although not very common, is cor pulmonale, both the chronic and the acute types. Advances have been made in the reduction of the number of cases as the result of protection from industrial dust disease, in particular silicosis, decrease in chronic and recurrent pulmonary infections, and more effective control of pulmonary embolism. By the time, however, that the heart is seriously affected, either acutely or chronically, with dilatation and failure of the right ventricle, the prognosis is very grave and life hangs in the balance. In the acute cases, there is as much, if not more, of a threat from shock or another pulmonary embolus as from the cardiac status itself. In the chronic cases, the underlying pulmonary disease or infection superimposed theron is likely to terminate life.

A grimmer problem is that of hypertensive cardiovascular disease because of its great prevalence and our failure to discover adequate specific therapy. There are many mild cases with good prognoses for many years, but, even of these, some become malignant; we cannot always prophesy which these will be. Even mild to moderate hypertension when added to other types of heart disease, especially the coronary disease, can be the "last straw to break the camel's back." It is in the study of patients with hypertension in particular that we need to gather together all known factors, such as heredity, on which to base a reasonable individual prognosis, since this condition almost more than any other allows a very great range of longevity. It is also of interest to try to determine when possible where the greatest threat lies, on the heart, on the cerebral circulation, or on the kidneys. It is all very well to state that about 60% of the patients with hypertension die cardiac deaths, that 20% have fatal cerebral vascular accidents, that 10% die of renal involvement, and that the remaining 10% die from other intercurrent disease. It is sometimes possible, however, to particularize in estimating the prognosis. For example, a very high diastolic pressure in a young or middle-aged man is an immediate threat to the heart especially; beginning abnormalities of urine and renal function point to serious kidney disease; and so-called hypertensive encephalopathy, especially with "little strokes," favors termination of life by a cerebral vascular accident.

Finally, the most difficult problem in cardiac prognosis, and one that concerns coronary heart disease, is angina pectoris. We have learned much about the prognosis of angina pectoris and myocardial infarction during the last 25 years, more than in all the centuries before and more than about almost any other aspect of the disease, such as pathogenesis and treatment; we have much more to learn than we know now, however. Even with what we have learned, we still feel that it is wise to "guard" the prognosis in almost every case. I believe, however, that if we analyze conscientiously all the other basic factors we are entitled to do more than to say of every patient with coronary heart disease that "God alone knows" about his future. It is here in a disease that is so prevalent and often so serious that we need most to apply what we already know or can learn about a patient both in our prognosis and in the limited treatment that we can recommend. Many patients with angina pectoris, whether mild on unusual effort or severe at rest, improve spontaneously or even recover completely in the course of weeks, months, or at most a few years because of the development of an adequate collateral coronary circulation. Some such patients are perfectly well 10 to 20 or more years after the first attack of angina pectoris, even though the electrocardiograms continue to be abnormal all the rest of the patient's life. On the other hand, some patients are so sick that they die of the very first attack or of some complication. What I have said about effort angina pectoris and angina pectoris decubitus is also true of coronary thrombosis with or without infarction; in the case of an infarct, a perfectly firm, well-healed scar may cause no trouble for the remainder of a long life.

In any case of coronary heart disease, no matter what its symptomatology, it is essential to appraise all the other factors in order to try to come to a reasonable conclusion about the prognosis. No two persons are exactly alike in these factors, and so we must particularize every case. At the present time, we are prone to say that the prognosis of coronary heart disease permits a range of one minute or less of life at the onset of the very first attack of angina pectoris to over 30 years for rare persons and that we have found that the average duration of life in several hundred cases of angina pectoris has been a little over 10 years, but that isn't nearly good enough. I'm sure that with the careful appraisal of all the factors, from that already referred to above as heredity to the last that I shall mention, namely the physician's own attitude, we can do much better in the future. We may eventually be able by the

laws of chance to be reasonably successful in a given case, but that case must be individually and carefully appraised.

There are less common kinds of heart disease that should be referred to very briefly. As a rule their prognoses are oftener dependent on involvement of other parts of the body by the same factors than on that of the heart, as for example malignant tumors, trauma, certain infections and infestations, collagen and blood diseases, and malnutrition with avitaminosis. We can say little about the rare case of extensive myocardial disease of unknown cause except that the prognosis is usually bad by the time such a diagnosis is made, and survival is for months, or a few years at best.

DEGREE OF DISEASE

Of prognostic importance at least equal to the kind of heart disease is the degree or severity of that disease. Although this would seem rather obvious and is actually generally taken into account by the physician in every case, it is not adequately expressed in books or other writing. It is perfectly true that there may be a "touch" of coronary heart disease, of rheumatic heart disease, or of hypertension or only very slight coarctation of the aorta or of pulmonary stenosis just as there may be a fulminating or extreme degree of any of these conditions. And there may be in the same case a slight degree of one kind of heart disease and a high degree of another. For example, I have seen serious myocardial infarction in a patient with a trivial old rheumatic mitral valve lesion; in such a case one should base prognosis on the severe lesion and not alter it much on the finding of the lesser lesion. It has been said that on occasion one abnormality may compensate somewhat for another, hypertension for coronary insufficiency or for rheumatic mitral stenosis, but I have not found it so. In my experience the various lesions are additive in their prognostic significance, except rarely in referring to a particular state such as systemic venous congestion caused by chronic constrictive pericarditis or tricuspid stenosis added to mitral stenosis. In the latter condition if there is tricuspid stenosis as well as mitral stenosis, life is shortened but there may be a longer period, years sometimes, of systemic congestion due to the mechanical effect of the tricuspid stenosis (or of constrictive pericarditis) than when right ventricular myocardial failure is responsible, caused as it commonly is by mitral stenosis or by left ventricular failure secondary to aortic valve disease, hypertension, or myocardial infarction. At one time, the outcome of subacute bacterial endocarditis was all or none. It was uniformly fatal so that it didn't much matter whether it was only mild when first discovered. Now that it is usually curable, its extent does matter, although there remain exceptions to that statement.

One of the most important clues to help in estimating the degree of heart disease is the size of the heart. In general, the larger the heart the worse the prognosis.

STAGE OF DISEASE

Generally speaking, the earlier the stage the less severe the condition, as in myocardial failure, and the better the immediate prognosis with adequate treatment. Atrial fibrillation similarly is more amenable to treatment with restoration of normal rhythm if recognized at or soon after its onset. Sometimes this statement doesn't hold, however, as in the case of massive myocardial infarction, which is perhaps the greatest threat to life during the very first hour or two when it may produce serious shock. Even here, however, the earlier adequate treatment can be applied the better the prognosis.

TREATMENT

And again this leads us naturally to the seventh factor, namely the adequacy of the treatment. When antibiotic therapy was first introduced for subacute bacterial endocarditis, there continued to be a high mortality (though less than before) because there was not enough penicillin for a good many of the cases. As soon as enough penicillin or other antibiotics were available and were given early and adequately enough, the mortality steadily dropped to its present figure of something less than 20%. Congestive heart failure, which was not very well treated in my medical student and hospital intern days, is now very much better handled with fuller application of satisfactory digitalis usage, the introduction of the low sodium diet, and the wide employment of the mercurial diuretics. Patients sometimes used to die water-logged only a few months after the first evidence of myocardial weakness and failure; now their lives are not infrequently prolonged for several years and the edema controlled, at least in large part. Today such patients still die, but they are no longer water-logged. More often they die from complications, such as pulmonary embolism, than from the heart failure per se. Even the most ignorant physician is supplied with therapeutic tools that permit him to prolong lives that would have been lost a generation or two ago.

MEDICAL KNOWLEDGE

And this in turn leads us to the eighth factor that influences prognosis. That factor is the amazing annual increase of medical knowledge resulting largely from research. Right around the corner there may be a cure, or at least some improvement of a current therapeutic measure, that may radically alter the prognosis. One of the most exciting examples of this possibility is that of congenital cardiovascular disease. Septal defects of the heart are conditions that may fit here. Until very lately only sporadic efforts were made to correct them, but quite recently cardiac surgeons have devised techniques that enable them to close openings in the atrial septum. It seems quite likely that within the relatively near future ventricular defects may also be repaired, especially if the blood can be temporarily diverted by an artificial pump. Aortic valve surgery is also in its infancy, and before many years we may be able to prognose about cases of severe aortic regurgitation or marked aortic stenosis more favorably. Who would have dreamed 10 years ago that surgical cure of coarctation of the aorta would be almost commonplace? Even serious and intractable angina pectoris is already yielding, at least for considerable periods of time, to the radical medical thyroidectomy effected by the oral administration of irradiated iodine.

PATIENT COOPERATION

One of the most vital of all the factors in prognosis is the cooperation of the patient himself. He should have enough understanding of his heart disease and of the treatment, including even the minute details thereof, and enough confidence in his physician to follow his recommendations wholeheartedly. The difference between life and death may easily depend on this factor. That is why it is so essential for the physician to establish at the very beginning a good relationship and to take time to explain as fully as necessary what is wrong and what should be done, without going into tedious detail or recounting all the bad complications that could develop. An hour spent thus may save weeks and months of miserable apprehension and unhappy rebellion. I cannot overemphasize the value of this relatively simple measure that can so vitally affect both prognosis and treatment. Also it saves the time and energy of the patient who, not learning enough from his physician, surreptiously or even openly resorts to medical or quack literature. If inadequately informed, the patient may "shop around" until he finds a physician or clinic to give him advice to suit his fancy.

ATTITUDE

The last of this series of factors behind cardiovascular prognosis, and treatment too, is the attitude of all concerned including the physician, the patient, his family and friends, and even on occasion the community too. Twenty-one years ago I presented a paper entitled "Optimism in the Treatment of Cardiovascular Disease" based on a group of patients who had gotten along better than had been expected. This experience added still more to my optimism, and this was reflected in the attitude of my patients. Yet optimism can be overdone. It should not be allowed when there is no possible justification for it. On occasion, it can give rise, when unwisely used, to overconfidence and carelessness on the part of both physician and patient and lead to unfortunate results. The old adage of "while there is life, there is hope" proves true often enough even in the sickest patients to justify its use without any overconfidence. The patient's interest in living may be supported by the attitude of those about him, and this may be the narrow margin needed for survival. It is, to be sure, difficult to weigh this factor of attitude, but from experience we know that it counts and so we should use it to the best of our own ability and try likewise to persuade the patient and those about him to make the most of it.

CONCLUSION

What remains to be done now is assessment of the relative values of the various factors that I have mentioned, but this an extremely difficult task to perform; in fact, in the present state of our knowledge, or of our ignorance, it is practically impossible. Every case must be appraised individually; in none are all of the factors of exactly the same value. Yet a start can be made now, and eventually this art can become a science. Each factor might be graded as favorable or unfavorable, then the various factors might be given relative values, and finally, a total estimate figured, based on the laws of probability, with still an additional percentage of something unforeseen. This obviously is too complicated at present and so I will not belabor the point. I do believe, however, that we can do better than we are doing now about the prognosis of heart disease.

264 Beacon St. (16).

ROLE OF PHYSICIAN IN PREVENTION OF MUSCULOSKELETAL DEFORMITY AFTER POLIOMYELITIS

Robert L. Bennett, M.D., Warm Springs, Ga.

Even as this report is being made, everyone is hoping that a vaccine will be developed that will prove that acute anterior poliomyelitis need no longer be feared. Although this is no idle dream but a reasonable expectation, it does not alter the demands for care arising from the epidemics of this year, of many years past, and, perhaps, of a few years to come. Because of the nature of this disease, its prevention, but not its cure, can be reasonably expected. To those physicians who treat the after-effects of poliomyelitis, this realization of their limitations is not new, and they are all keenly aware that despite their greatest efforts, their success in preventing deformity and restoring some measure of physical independence must soon seem negligible when compared with the proof that prevention of the disease itself is assured.

Since it is so easy to blame the limitations on the nature of the disease itself, it becomes all the more necessary to assess the physician's possibilities and thereby define his responsibilities. Admittedly, the after-effects of poliomyelitis are difficult to care for, but there seems little excuse for the gross negligence and disregard of principles of care so commonly seen. Because no two patients are alike, the physician can blame the products of his inadequacy on the underlying disease, the patient's personality, the family's lack of cooperation, in fact everything but his own failure to provide the necessary essentials of care. At the very least, the physician who accepts the responsibility for the care of the patient with poliomyelitis must have the training and facilities to prevent or minimize, insofar as is humanly possible, the musculoskeletal deformities so characteristic of the after-effects of that disease.

Even though adequate facilities for intensive muscle reeducation are not always available, the control of deformities must be accepted as the physician's respon-

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sibility. Before this responsibility can be fully appreciated the following facts must be recognized: 1. The causes of deformities can be determined before the deformity is evident and in most cases can be adequately controlled if discovered and treated early. 2. The presence of even mild deformities can severely limit the possibilities of recovery through muscle reeducation and functional training. 3. A deformity never exists alone, but rather one deformity causes another and can be expected to cause a chain of disabilities, perhaps far removed from the site of the original one. 4. Deformities must be prevented, because they rarely can be corrected by conservative measures once they have developed. These are proved facts, not fancies, and put the responsibility squarely up to the physician who accepts the care of these patients.

Unfortunately, the development of the usual musculoskeletal deformity is slow and insidious. At its beginning it does not cause specific pain, swelling, fever, unconsciousness, or any of the symptoms or signs commonly associated with impending disaster. Many physicians who would consider it a disgrace to permit an appendix that is acutely infected to rupture while a patient is under their care apparently have no such feeling about development of deformities in their patient with poliomyelitis. Too frequently the physician is incapable of examining the musculoskeletal system. By the time he finally realizes that all is not well, deformities are far advanced and largely uncorrectable.

It can be said that, when a deformity is easily recognized, it is then too late to do much about it. Simply stated, the deformities that are included in this report may be defined as distortions of bodily alinement and/or mobility due to structural changes in the tissues that make up the musculoskeletal system. If atrophy due to denervation and the depression of bone growth that probably has the same basis are excluded, it can be stated that all other deformities result from nothing more mysterious than persistent, faulty position. It must be realized that, if any portion of the body is repeatedly held or forced into a faulty position, irreversible changes in those tissues making up that bodily segment must eventually take place. Thus, deformities can occur during periods of rest or activity. They will develop in direct proportion to the intrinsic strength of the tissues involved, the force of the stresses applied to these tissues, and the period of time these stresses are applied.

The causes for faulty positions are many. Muscle weakness, or imbalance of muscle strength, and changes in the intrinsic tone of supportive structures are usually the underlying factors in the development of all deformities. Certainly these may be complicated by the presence of pain and spasm. Even these factors would not cause significant deformity if not aggravated by the controllable factors of poor nursing techniques, inadequate splints and braces, haphazard patterns of movement, obesity, irresponsible weight bearing, and overactivity. There are many methods of preventing deformities, ranging from the use of pillows and sandbags grossly supporting the body to plaster casts completely enclosing the involved segments. Each method has its advantages and disadvantages. Pillows and sandbags are immediately available, are easily rearranged, and, if used expertly, provide the comfortable support so necessary during the acute and very early convalescent phases. But pillows and sandbags are of little or no value when activity is increased. Plaster casts can be readily applied and will rigidly hold any position the physician decides is necessary, but closed casts preclude the maintenance of joint mobility and the early graded activity that constitutes the basis of modern treatment. Neither of these methods, therefore, have more than temporary value, and they constitute a real threat to the patient's future if used too long. Optimum recovery demands a careful balance of activity and inactivity during convalescence. This usually requires at least the temporary use of supportive apparatus. When externally applied support is necessary, it must be easily applied and just as easily removed. It must adequately support the weakened segments and, if at all possible, permit and even assist safe patterns of movement. Unfortunately, such apparatus is not always readily available. Many brace makers have been slow to accept their responsibility as a member of a team that must function not only expertly but quickly. Deformities, particularly in the hands and feet, develop rapidly and might well be irreversible if the splints are not delivered until weeks or even months after they are ordered. The medical profession would not tolerate such irresponsibility from a druggist. On the other hand, if all physicans who treat patients with poliomyelitis were capable of determining the type of apparatus necessary, capable of writing specific prescriptions to the brace maker, and then intelligently checking the final fitting, the brace makers, I feel sure, would do their part.

Too frequently, a brace maker is blamed for his inability to make a comfortable and well-fitting hand splint, corset, or leg brace when the real reason is that the physician failed to see the need for such apparatus until after deformities occurred. Structural deformities of the hand and wrist, back, knees, and feet simply cannot be fitted with effective apparatus regardless of the skill and responsibility of the brace maker. It must also be realized that children grow, both children and adults change weight, and apparatus wears out. The perfectly constructed brace, corset, or shoe may be more dangerous than no support at all if the child grows out of it or it becomes distorted with use.

Perhaps too much emphasis has been placed on the use of apparatus in preventing deformity. It must be realized that the prevention of musculoskeletal deformities can never be accomplished through the use of apparatus alone. Recovery and resumption of activity go hand in hand. No brace, corset, or splint, regardless of strength and perfection of design, can possibly completely protect the patient against deformities arising from haphazard patterns of movement and overactivity, particularly in weight bearing positions. Obviously the physician must be trained and experienced in kinesiology so that he can recognize faulty positions and movements that must in time cause deformity. During convalescence only those activities that can be done coordinately and safely are permitted. In the chronic stage, functional

activity may demand the use of abnormal patterns, but activity that would endanger future structural alinement must never be permitted. The physician should be constantly looking ahead to be sure activities permitted will not bring about deformity later.

When spotty paralysis so typical of poliomyelitis results, the remaining muscle strength may frequently have little value from a functional standpoint but may act as a severe deforming factor by its unopposed action. Muscle imbalance about the foot and hand commonly cause deformities in this manner. This requires careful evaluation by the physiatrist and orthopedic surgeon. If balance through muscle reeducation is not thought possible, then the deforming action should be eliminated by tenotomy. If possible, the insertion of the tendon should be transplanted to another position where use can be made of the strength of the muscle without its deforming action.

Even if an extremity is extensively paralyzed, it should be kept mobile and in good alinement. The use of assistive and adaptive apparatus including externally applied prosthetic appliances makes it possible to restore some degree of usefulnesss even to completely flail extremities. All too frequently, we find that such apparatus cannot be used because limitation of motion and structural distortion of the extremity has been permitted to occur. This is particularly true in involvement of the upper extremities where contractures make it impossible to apply "feeders" and other adaptive apparatus. Amazing improvement in functional capacity of an extremity with spotty paralysis is often possible through orthopedic surgery. Again too frequently, the extremity is neglected because "surgery will be done later." When the time for surgery finally arrives, deformities have developed and the surgeon is faced with an impossible problem.

Some of the most tragic examples of faulty positioning are seen in patients who were confined to respirators during early convalescence. The fact that a patient was confined to a respirator is no excuse for the severe contractures so commonly seen about the thumb, fingers, wrist, forearm, and elbow. The early and intelligent use of hand splints and gentle mobilization will easily minimize these deformities of disuse and persistent faulty position and will in no way interfere with the more dramatic lifesaving procedures. Again and again we have seen patients whose life was saved by the skilful use of respiratory aids only to find when they were finally weaned away from these aids that irreversible deformities of bodily segments had occurred. Even in the most critical and drawn-out respiratory problems, these deformities could have beep kept under control.

While there should be no compromise with normal skeletal alinement, the degree to which bodily segments are mobilized should be specifically determined in each individual case. If persistent contracture of tissues exists, it is wise to assume that underlying muscle weakness also exists. When significant weakness exists, "fortunate" or planned tightness may be necessary to prevent structural deformity and support necessary activity. Irresponsible stretching of the weak back might permit scoliosis to develop, which a little tightness would have prevented. Irresponsible stretching of the triceps surae might permit a severe calcaneous deformity to occur. Planned tightness would have safely anchored the os calcis and prevented its forward migration. A good rule to follow is that no structures should be stretched unless there is accurate knowledge of the underlying strength and the possibilities for deformity if mobility is accomplished.

SUMMARY

The prevention of structural deformities of the musculoskeletal system following poliomyelitis must be accepted as the physician's responsibility. Not all deformities can be completely prevented, but they can be kept within reasonable limits by known methods. No physician should assume the care of patients with the after-effects of acute anterior poliomyelitis unless he has (1) an understanding of the pathogenesis of musculoskeletal deformities, (2) knowledge of the relative importance of the various deformities and their relationship to each other, (3) training in kinesiology with the ability to recognize normal and abnormal static positions and movement patterns, and (4) the tools available to care for the factors that result in deformity.

Tumor Metastases.—The invasive properties of leukocytes and macrophages depend on their being isolated single cells and on their highly developed ameboid motility. That cancer cells also possess ameboid motility was reported as long ago as 1863 by Virchow and has been demonstrated in tissue culture by many workers in recent times. These tissue culture studies have shown beyond all doubt that tumor cells in general are ameboid, whether they are of mesodermal or epithelial origin.

Neoplastic epithelial cells from carcinomas of man and of laboratory animals have been photographed with a moving picture camera and their rates of speed determined. Cells from breast cancers, for example, moved at an average of 0.7 μ/min., with a maximum rate of 2.4 μ/min. Cells from a carcinoma of the kidney attained a maximum rate of 4.4 μ/min., while some cells from a mouse fibrosarcoma traveled at 6.2 μ/min. Of additional interest is the observation that even tiny clusters of three to five epithelial cells from a rabbit carcinoma progressed as an ameboid unit. It was also demonstrated that the cells of benign epithelial tumors and even nonneoplastic glandular epithelial cells (from cystic disease of the breast) may be motile in tissue culture, provided that these cells are first forcibly detached from their companion cells. It appears probable, then, that the local invasiveness of cancer cells depends upon their ability to progress by ameboid movement.

Why, then, do not the cells of benign tumors or the cellular components of the various organs also invade, since they too, at least in some instances, are capable of ameboid motility? There is evidence to indicate that the cells of normal tissues and also the cells of benign tumors are so firmly attached to one another that they are unable to escape. In contrast, the cells of malignant tumors are often found in the body free from the parent tumor.

The reason that the cancer cells become free is their greatly reduced adhesiveness. Micromanipulation studies have shown that the magnitude of force required to separate a pair of normal squamous epithelial cells from each other is much greater than the force required to separate cancerous squamous cells.—Dale Rex Coman, Mechanisms Responsible for the Origin and Distribution of Blood-Borne Tumor Metastases: A Review, *Cancer Research*, June, 1953.

PRIVATE BEDS IN MEDICAL TEACHING

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Teaching hospitals face today the large-scale use of private beds in their programs. The pressure is economic and unavoidable. Twenty years ago a public ward bed cost the patient $4 a day and cost the hospital not much more. Many a privately endowed teaching center had over 200 public ward beds divided among the teaching services. Today a ward bed costs the hospital between $15 and $20 a day. If the endowed hospital assumes the cost of as much as half the patient's bill, 200 teaching ward beds cost the hospital well over $600,000 a year—the interest on a 13 million dollar endowment. Most hospitals do not have such financial resources. The few that have, because of research and other commitments, do not want to expend all their funds on ward beds. With the growth of private hospitalization insurance, they are finding that they do not have to.

More and more insured patients demand private medical care. They enter the ward bed from the private physician's office, and they return to the office for follow-up. Hospitals that continue "free dispensaries" find little room to hospitalize their sick under the same roof and the care of the house staff. A dispensary without ward beds has no educational role. It can no longer provide vital continuity of patient observation.

With the shift to greater use of private beds, the practicing physician again resumes his ancient role in medical education. The patients are his, not those of his service chief, of the educational director, or of the medical school department head. The educational result is directly determined by his teaching skills, by his philosophy as to proper relations of old and young in medicine, and by his wisdom in appraising his freedom to act independently under pressures. The full-time staff member, the professional educator, at best can only help.

Therefore, this report is prepared for the practicing physician who wants background information on modern processes and standards of clinical education to strengthen teaching in his own hospital. It is not intended to provide the complete background. Taken as such, it will surely fail, for it represents a first and partial study. It poses many questions whose answers I do not know. It is based on about five years' experience in a predominantly private bed teaching hospital, in which I was a department head, more than five years of teaching at predominantly public ward hospitals, and many periods of observation of various types of hospitals over the country. In many such institutions the problems are being given vigorous thought and action. In the subsequent discussion some arbitrarily selected centers are cited, not as having uniformly workable solutions but as a profitable starting point for inquiry and visit. Many others that are not cited are as important in their contributions.

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THE PROBLEMS

"Private beds in teaching" has been the subject of many a discussion at many a recent meeting of medical educators. Sometimes it is presented as a comparatively easy shift in patient material, but this is not always the case. True, a few hospitals, through concerted effort on the part of the attending staff, have successfully made the shift. They compete successfully for a high caliber house staff in this era of large discrepancies between number of positions and number of candidates. Other hospitals, sometimes as rich in facilities and in a respected senior staff, have not been so successful, despite elaborate printed programs, rising stipends, and full-time department heads.

Before the economic impact of World War II, the public wards and the dispensaries were the usual domain of clinical teachers. When chosen for his ability in and love of teaching, the ward clinician has always held high honor in his hospital regardless of the size or make-up of his private practice. With the exception of a very few centers, medical students were rarely assigned to private pavilions or semiprivate wards. When they were, they were usually paid an extern stipend as a recompense for lack of educational function.

The old hierarchical distinction between the private and ward house staff has been familiar in many a hospital dining room. Competition for the ward jobs was intense. The happy winners began by working 18 hours a day for board, room, and laundry. The private jobs in the same hospital often were held by men waiting, and saving, for a ward opportunity.

By and large, the public wards of our teaching hospitals have set a very high educational standard (though those indifferently staffed have sometimes fallen far below the few old-time private services that took teaching as their business). In my own experience it has been the exceptional graduate of the unusual private service who can match the good public ward service graduate in early clinical maturity, in habitual application of scientific knowledge, and in critique. Although not so sharply distinguishable in his forties as in his thirties (the able man, no matter where trained, inevitably passes any colleague who relaxes his effort), the ward-trained physician's familiarity with independent action under supervision, in addition to his technical skills, seems to have given him this initial lead and the habit of continued self-education.

The graduate of a pre-World War II senior residency has sometimes found himself prepared to undertake far more serious problems than his first private patients might have wished him to assume. Though lack of opportunity to take advantage of his training was perhaps briefly troublesome for the young physician's ego, few of his patients suffered purely by reason of his intensive hospital training for it often gave him experience for which physicians of previous generations had to wait many years in apprenticeships, and let him grow as fast as intellect and character permitted.

Many elements of the apprenticeship have survived in the public ward system in a broadened form consistent with the impact of microbiology, physics, chemistry, and psychodynamics on clinical practice. The medical student, released from the lecture room seat, became an apprentice of the intern at the bedside and in the clinical laboratory in his third and fourth years; the intern became the apprentice of the assistant resident. These younger residents, no longer bound to a single man in practice, served successively as apprentices of several men of diverse scientific and clinical skills.

The keynote in this type of residency was graded responsibility. At every level (medical student to senior resident), performance was under open appraisal. Those unfit by temperament or ability for further progression as a rule were as readily relieved of responsibility as those who were able were advanced. This has been often true for the attending staff. Hospitals devoted to teaching have effected ward staff changes with far fewer repercussions than are regularly occasioned when a physician's access to a private pavilion is limited or cut off. Ward beds may represent a physician's public service, his study, or his prestige. Private beds represent his livelihood. Independent private practice still fills the majority of private hospital beds in this country. It is, and must be, the core of our discussion. Most patients enter these beds because of the physician's individual standing in their eyes. The educational standing of his hospital is of lesser importance.

Every physician is in competition with at least some of his colleagues as well as others who profess, without formal medical training, to treat the ills of mankind. Often he is in competition with members of his own staff. Competition, in differing form, exists for privately or university-managed group practice. Most of the real and difficult educational problems that face private services stem from these facts. To meet them, factors determining local answers to these questions need evaluation. They vary for each medical center.

For the training of students and interns, the following questions might be asked: 1. What physician-patient and physician-physician relationships determine effectiveness when private patients are the teaching material? 2. Can the private services present a proper range and severity of illness? 3. Can the private service follow-up opportunities provide proper continuity of patient observation?

In training of residents, one might ask: 1. What physician-patient and physician-physician relationships affect the sharing and delegation of clinical responsibility for private patients? 2. How does teaching with private patients modify a physician's attitudes toward the incomplete nature of medical knowledge and the ritualistic aspects of medical practice? 3. In a teaching hospital with a large financial deficit, can the shift to private patients be done without the loss of educational standards? If not, what is the minimum proportion of public ward beds necessary? 4. If a private institution cannot afford this minimum, what determines success or failure of cooperative plans with tax-supported hospitals?

For all levels of teaching, one might ask: What factors have governed and what factors should govern the selection of attending staffs on private teaching services? What can be useful roles of trustees and of universities?

TEACHING OF CLINICAL CLERKS AND INTERNS ON PRIVATE SERVICES

The teaching hospital has been called the conscience of the medical profession, in providing a place in which questions must be asked, may be asked by anyone concerned with patient care, and must be answered if possible.[1] Such an atmosphere cannot but enhance standards of care for patients of any economic status, wealthy to indigent.[2] Let us, however, examine the patient's schedule for the first three hospital days on an average public ward. Day 1: (afternoon) admission history, physical examination done by intern and (evening) repeated, with routine laboratory work by fourth year clinical clerk. Day 2: (early morning) checked by resident and (midmorning) checked by attending physician on teaching rounds; (afternoon) two third year clerks arrive and fail to see the patient, who is undergoing roentgenographic studies. Day 3: (morning) third year clerks return to take a history and make a physical examination without looking at the chart; (afternoon) four to eight second year students elicit a halting history and laboriously stare at, feel, thump, and listen to designated body areas. A private patient will not submit to this type of schedule. The ward patient often does so through lack of an alternative.

Where the tact and humanity implicit in the golden rule obtains, the usual teaching exercises, such as bedside rounds, detailed case presentations, checking of physical findings, and amphitheater demonstrations, have been successfully carried out with private patients.[3] These courtesies are as follows: 1. Always ask both the patient's and the attending physician's permission. 2. Always tell the patient what to expect. 3. Never discuss details of diagnosis, therapy, or prognosis before the patient unless properly authorized. These rules are as applicable on a ward as on a private pavilion. Though the cost is irrelevant to teaching value at this level, there must be enough patients and with examples of pathological conditions corresponding to the serious pathological lesions the young physician will later encounter.

RANGE OF CLINICAL MATERIAL ON PRIVATE SERVICES

Though some physicians are destined to spend three-quarters of their lives treating patients with minor complaints, students, interns, and residents need as inpatients persons who are really ill. A backlog of hard-thinking experience acquired during youth with the seriously sick is invaluable to a career of sorting major from minor illnesses and to an appreciation of interactions of "organic" with "functional" factors. On some private services the range of disease compares with the best of teaching wards; on others it does not. The reasons for this are varied. A busy physician may find certain new patients hopelessly time-consuming for office schedules. A surgeon may find growth of practice coincident with increasing subspecialization. Each physician has an interest, both financial and human, in securing admission

1. Armstrong, S. H., Jr., and others: Report of the Advisory Committee on Internships to the Council on Medical Education and Hospitals of the American Medical Association, J. A. M. A. **151**: 499-510 (Feb. 7) 1953.

2. Gregg, A.: On Medical Education, Chinese M. J. **64**: 145-148 (May-June) 1946.

3. Halsted, J. A.: The Role of the Nonteaching Hospital in Medical Education, New England J. Med. **243**: 730-733 (Nov. 9) 1950.

for his own patients. This can, but does not always, coincide with teaching interest. When interests regularly conflict, the private service encounters a problem in teaching material as serious as that of the university hospital that admits patients according to staff research interests. "Three-day work-ups" and "sales force check-ups" can ruin a private medical service for teaching as effectively as a predominance of rectal or industrial cases can ruin a general surgical service.

Such patients have educational value only when (*a*) they are so selected that a high percentage reveal illness severe enough to warrant hospitalization and (*b*) the work-up of student and/or house officer is listened to and appraised and a plan of action and follow-up instituted before the patient's discharge. This has been successfully done on the residency level at the New England Medical Center's Pratt Diagnostic Hospital, Boston (Samuel Proger, M.D., chief),[4] and on the student level at Georgetown University Medical Center, Washington, D. C., (Harold Jeghers, M.D., chief of medicine).

Is the remedy to formulate hard and fast admission quotas for teaching needs and to put an experienced resident in charge of their day-to-day enforcement? From the resident's standpoint, the answer is no. True, the admitting resident on a public ward gets valuable training in rapid clinical judgment. Few sensible persons would want to screen admissions from a large practicing staff. The chances of remaining anyone's friend are small, no matter how astute or fair one may try to be. From the patient's standpoint, the answer is also no. His physician has screened him. From the senior administrator's standpoint, again the answer is no. He himself has no time to screen individual admissions. His usual lay admitting clerk scarcely can be expected to be sensitive to teaching values. This clerk can, however, record admission and discharge diagnoses for every patient and tabulate these, together with duration of stay, for every physician and every service. This shows which physicians carry the greatest daily responsibility for the spirit of the teaching hospital.

The first step in the remedy is regular publication of such a report to all involved in educational policy—to staff, administrators, and trustees. I have prepared representative tabulations for 1948 to 1951 for the department of medicine of the Presbyterian Hospital of Chicago. For such data, which are necessary for equable house staff assignments, it is unwise to rely on word of mouth reports from the house staff.

When an administrator finds difficulties in publication of the report, or the report is not read, this may reflect the wish of a significant part of the staff that education keep out of the way of existing practice. The admitting policy that cannot be subverted by persistent sabotage does not exist. When, per contra, publication is welcomed, the following questions come to open appraisal: What patients should not be assigned to the house staff or students? Should there be a "two-day limit" ward for emergencies, real or suspected? Should there be a unit for centralization of studies on long-term patients? Is an inpatient diagnostic unit needed? An inpatient diagnostic unit such as that at Columbia-Presbyterian Medical Center in New York (R. F. Loeb, M.D., physician-in-chief), can help to solve the teaching material problem mentioned above by segregating purely service work. Such a unit helps the physician who wants this work. It reduces the hospital's overhead on roentgenography and laboratory procedures. It can help the hospital's drive for funds, for it is not always the sickest patient who carries to the community the word that the hospital does a good job in service.

Highest standards of medical records and of personal performance of critical laboratory work can be successfully required of interns and students elsewhere in the hospital, where the records deal with real illness in contrast to the endless negative results and the complaint "we are being exploited as routine technicians" is validly eliminated. It should be noted in this connection that the recent report of the Advisory Committee on Internships [1] emphasizes these standards and recommends that personal performance of laboratory work be made mandatory during some phase of every approved internship.

Through study of such matters many hospitals have formulated workable admission policies aimed at needs of both education and practice. If they are wanted and backed by the staff and kept flexible and checked by the monthly admission data, chances of success are good with a minimum of cumbersome administrative rulings. Some hospitals enforce rigid regulation of a physician's admissions according to his role in the educational or research program. Applicable in university hospitals, such regulations are met less frequently in primarily service hospitals with teaching aspirations. If there is a keen general interest in teaching, it is feasible to assign house officers in terms of teaching performance, which includes a proper selection of patients for admission. This renders the hospital's competitive position for house staff less vulnerable to a staff minority.

The private services of the Barnes Hospital in St. Louis (Harry Alexander, M.D., chief) provide an example of policies regarding bed and house staff assignments in relation to teaching needs.[5] Policies regarding admission times for patients, etc., in relation to teaching needs are exemplified by the Emory University Hospital in Atlanta, Ga. (David James, M.D., chief of private medicine).

FOLLOW-UP OF PRIVATE PATIENTS

Without early establishment of habits of following the individual patient, the physician begins and may end by handling disease as a disembodied constellation of symptoms, signs, laboratory findings, and behavior characteristics artificially suspended in time by the accident of discontinuity in study.[6] Disease processes are not static, and the sequences need to be seen in embodied form.

On a private service great personal effort must supplement written schedules. The house officer must list patients on whom follow-up is wanted and arrange confer-

4. McCombs, R. P.: Diagnostic Clinics for Private Ambulatory Patients, J. A. M. A. **148**: 113-115 (Jan. 12) 1952.

5. Alexander, H. L.: Successful Training Program for House Officers on Private Medical Service, J. A. Am. M. Coll. **24**: 236-238 (July) 1949.

6. Cadmus, R. R., and Thoms, E. J.: The Group Clinic: A Pattern for the Future, Mod. Hosp. **70**: 48-50 (April) 1948. Futcher, P. H.: A Private Outpatient Clinic in a University Hospital: Its Role in the Teaching Program of the Department of Medicine, J. Med. Educ. **26**: 430-436 (Nov.) 1951.

ences flexibly enough to meet schedules of students and of the private physician.

The spontaneous development of staff groups interested in a certain type of disease can result in flourishing joint follow-up clinics. Patients are often under care of physicians in independent practice, as in the case of the work in psychosomatic disease at Michael Reese Hospital (Roy Grinker, M.D.), and the tumor clinic (representing surgery, medicine, pathology, and radiology) at Presbyterian Hospital (F. H. Straus, M.D.), Chicago. These clinics cannot be forced; spontaneity is their essence. Thus the emphasis of the psychiatric aspects of ordinary medical and surgical practice is impossible on private services where recent advances in psychodynamics are unfamiliar.

The private physician's share of effort is much more efficient if his office is in or near the hospital. If it is on the other side of the city, it is hard to persuade the busy patient to "drop over to the hospital next Tuesday so that Dr. X and Dr. Y who helped take care of you can join in observing progress."

This also goes for the busy private physician. When he has an office full of waiting patients some traffic-filled miles away, his daily answer to students and house staff can be, "Look, just do this, I've got to go." He goes, and they do as told. "Rounds and run" is as bad for the interchange of medical thought as "eat and run" for interchange at a dinner party. Thus offices close to the hospital can be as important to the community hospital with a good intern program as to the university center.

TEACHING ROUNDS AND CONFERENCES

The first American clinical professor of medicine described the function of teaching rounds for his hospital trustees in 1766 as follows:[7]

> There the clinical professor comes to the Aid of Speculation. . . . He meets his pupils at stated times in the Hospital . . . he asks all those Questions which lead to . . . knowledge of the Disease and Parts Affected, and if the Disease baffles the power of Art and the Patient falls a Sacrifice to it, he then brings his knowledge to the test, and fixes Honour or discredit on his Reputation by exposing all the morbid parts to view. . . .

The strong words of the Advisory Committee on Internships [1] add little beyond 20th century emphasis to Dr. Bond's thought.

Why do teaching rounds face special problems on private services? To be assured that all persons involved (student to resident) are working on the implications of every case takes time. The private physician already knows his patients to variable extents. Unless he also knows that properly stimulated students and the house staff will inevitably unearth some important fact about his patient he does not know or some pertinent literature he has not seen, he may regard the time of teaching rounds as wasted.

Then an occasional physician, skilled in running a large practice, finds himself ill at ease, even unable to talk, in guiding lively two-way communications between colleagues of grossly unequal experience. He feels as much out of place as many an inspiring teacher and researcher might feel in a busy private office.

Delegation of rounds is a valuable though partial solution. Despite the value for specialized (infectious disease, neoplastic) rounds, unless the private physician reserves some part of the bedside teaching for his own efforts, service *esprit de corps* suffers as badly as does his opportunity for continued self-education.

These precautions are a minimum: 1. Whatever the conclusions on teaching rounds, the program set up by the patient's own physician with the house staff must never be interfered with. 2. Questions of diagnosis or therapy must never be discussed within earshot of the patient or the patient's relatives. 3. Requests for a consultation with the physician in charge of rounds must in general be treated with great circumspection. When a physician says, "I'll take care of the patient; you do the teaching," he describes a workable division of labor only when there is real closeness between the two in technique and philosophy of medicine. Successful collaboration of full-time and practicing teachers was recently achieved on the private medical services at Johns Hopkins, Baltimore (Earle Moore, M.D., chief of private services).

Recently several private hospitals have sought as service chiefs men with records of good basic research and public ward teaching. Now granted no one is so effective in teaching bedside medicine as the laboratory-trained man who is equally at home with ears, eyes, hands, and deeper emotional sensibilities and who keeps the laboratory in proper perspective, yet the career full-time teacher has little experience with the complex system of loyalties, favors, and indebtedness that determines the daily events in a private hospital. His eagerness to benefit teaching can, in changing the old order of things, seem to his staff destructive. Accustomed to moving between investigative centers, he is not used to the need of a practicing physician for stability. In turn, many a practicing physician who wants a first-rank teaching program has not seen one in operation since he was a student and does not know the price in his time, tact, and thought. If there are difficulties, he is more likely to cooperate with a chief who at some period has had the same difficulties.

If many attending physicians, with or without cause to the outward eye, grow jealous of the men to whom teaching is delegated, teaching by two way communication dies. I have seen teaching die through jealousy toward no one more formidable than able residents. Revival through exercise of the authority of the dean or department head just does not happen. Thus I think the best leadership is achieved by a man who has spent a year or so in his own private practice or assisting an older man in practice before devoting full time to teaching.

Dr. Bond's rounds continued to the autopsy table when indicated. Today they would include many other laboratories. However, the critically important "death meeting" (where the sequence of each fatal case is discussed by all concerned) and the clinical-pathological conference may be impeded when a private physician feels the honest recognition of an error before his juniors may be used against him professionally. Though many staff members may be glad to "fix honor or discredit" on their reputations under proper auspices, pathologists and

7. Bond, T.: The Utility of Clinical Lectures (1766), quoted in Flexner, A.: Medical Education in the United States and Canada, Bulletin 4, New York, The Carnegie Foundation for Advancement of Teaching, 1910, p. 4.

others with special knowledge have found it wise to be gentler with clinical colleagues than is customary in some of our famous ward amphitheaters and have done so without sacrifice of truth. In some places, however, the fear or undue professional discredit has been backed by an occasional concrete incident. The attitudes of teaching cannot be forced on a staff. A realistic appraisal of the hospital and community atmosphere becomes essential. Will time and medical statesmanship help? If not, efforts toward a first-class program may prove wasted.

RESPONSIBILITY FOR PRIVATE PATIENTS ON ASSISTANT RESIDENCY LEVEL

In assistant residencies the young physician should begin to learn his more mature functions through supervised performance. These include explanations of therapy and prognosis, operative procedures, or special examinations and the giving of advice, encouragement, and when indicated, comfort, in addition to running the service smoothly. On a public ward service the role of assistant resident overlaps none other in these functions. House staff applicants often explain their preference for a public ward service by the phrase "greater chance for responsibility."

Thus a private service that hopes to attract applicants must provide some chance for action. If it does, I think a case can well be made for a private service's intrinsic superiority to a public ward at this stage of training. If not destructive in intensity, competitive practice can breed a matchless spirit of detailed attention to patients' needs. To be the junior teammate of a man versed in the humanities as well as skilled in the techniques of medicine can give lifelong illumination. When clinical responsibility is intelligently shared, the senior man wins a warm regard from his team that patients rarely fail to sense.

Unfortunately, some technically skilled physicians do not want a team; they want a retinue (patients rarely fail to sense this, either). These physicians do not want residents to order determinations of venous pressure, phenolsulfonephthalein tests, or other tests without specific authorization. To point out that on many private services responsibility is shared with benefits to the private physician, house officer, and patient is often useless. Some feel the patient's patronage depends on singlehanded direction of every detail; others have deeper private reasons. When a hospital's intern committee hears in the corridors, "We want fewer residents and more interns," chances for a good residency are slim.

Sometimes physicians will "delegate responsibility" if, and only if, the assistant resident has learned elaborate and rigid procedural patterns. Although a physician in a busy practice has often amassed considerable knowledge of techniques, when these become unchangeable then the service can only be said to "train" as animals are "trained." Its true educational function is valueless, save to those who have already learned the art of self-education.

Routines and rituals in medicine have a far deeper basis than utility as short cuts. The physician of today, with all the facilities of modern science at his disposal, is still like the temple physicians of the ancients in being asked to alter the course of many human maladies when he does not know how. Even psychoanalytic techniques, which have done so much to illuminate the role of symbolic ritual in human life, have themselves become so ritualized in certain circles that physicians endeavoring to apply scientific method in the further development have been excluded from psychoanalytic societies. Ritualistice aspects of care can be of value and are harmful today chiefly when dogged adherence blocks the adoption of more rational approach. On a private service there is opportunity to become aware of both the valuable and harmful sides of rigid procedures if the attending men have sufficient inward peace to be able to say "we don't know" with considerable frequency, to be able to discuss their own and alternative regimens without feeling their own functions as physicians are attacked. This inward security makes for a service discipline that, though apparently minimal in routines, is truly the most exacting of all. It is when they are headed by men of this type that I have seen private services clearly excel.

ADVANTAGES OF WARD BEDS FOR SENIOR RESIDENCY

The senior resident is ready to take charge of his own group of patients. In surgery this means operating, not only serving as first assistant. In other fields it means the responsibility for making major decisions and seeing that they get implemented.

For these, private patients pay their physicians. Here private beds cannot easily match the educational power of the well-run ward. Can a physician in practice delegate major clinical responsibility? Usually, no. Only under unusually favorable circumstances does the no become a weak yes. Most men who have themselves had the privileges of a real senior residency want them for their juniors and will work hard to set aside residency beds, though pressed in the early years of establishing practice.

Private patients who come to a hospital without a physician or are chosen by other criteria have sometimes been assigned to supervised senior residency care. Successful in some hospitals with senior residency tradition, this demands that the attending staff work as a team. The recent work of the Cornell University department of surgery (Frank Glenn, M.D., chief) is an important example at the New York Hospital. This service, despite difficulties, has had some success in senior residency training on private patients. The similarly organized program in medicine at Presbyterian Hospital, Chicago, that was previously reported [8] has had to be abandoned, in part through absence of staff support. The patient must always be told of the resident's role in the team. That the attending staff members feel free to do so is a good test of whether a hospital can be successful in giving a private patient senior residency care. Few indeed are the private services where the senior staff man feels he can step around the table to the first assistant position and permit the senior resident to perform the whole of a major operation. Almost no independently practicing surgeons feel free to do this. This is also true for private clinics operating wholly for profit. An intermediate policy obtains at one of the country's greatest private clinics, which, though dependent on patient fees, supports a

8. Cohn, E. J.: Research in the Medical Sciences, in Medicine Today: March of Medicine, 1946, New York Academy of Medicine, Lectures to the Laity, no. 11, New York, Columbia University Press, 1947.

large research and educational foundation. Here the staff tries to put its senior surgical fellows in charge during a part (not just the opening and closing) of every major procedure, in the hope that internal synthesis of the real but disjointed operative experience will lead to the same development of skill as the performance of whole operations. At the other limit stands a university-owned, nonprofit private hospital engaged in institutional practice, whose senior surgical resident functions as a full-fledged junior staff member.

Wherever heard, the query, "Is the hospital practicing in competition with us?" needs the further question, "How serious is this competition?"

When many of a staff have not had senior residency experience, they have trouble in making a senior residency more than an extension of the assistant residency. They feel the senior residency is superfluous. They point to many excellent men who never had one. Twenty years ago when the public ward system was most in use, the "pyramidal" residency progression provided few senior residencies in our teaching hospitals. Many who wanted them and were qualified never achieved these posts.

With the addition of private services, a great quantitative gain can come. In essence, we may thus multiply our senior residencies up to the real clinical resources of any given institution. It is vitally important that in so doing we do not go beyond these clinical resources.

The habit of self-education is not the property of any single training method. Yet refresher courses can never replace the habitual reading, observation, and self-scrutiny forced on the senior resident who takes major responsibility under the supervision of conscientious teachers. In the thousand years between Galen and the Renaissance, medicine made almost no advances. Techniques could be taught to apprentices with assurance that they would be as much a part of accepted practice in the physician's old age as in his youth. Today's rapid strides in basic sciences [8] make medicine's chances of becoming static again slight, but make the chances of failure to advance greater for the individual. Very few persons who have been senior residents fail to continue the habit of keeping up with advances in knowledge.

In view of these situations, some public ward beds are essential. How many? The ratio of 1 to 7 (public ward to private) is a useful approximation for hospitals with a total of 250 or more beds. The basis for this estimate has been published elsewhere.[9] This minimal figure highlights the situation in some private institutions whose senior residency programs are functioning inadequately from the educational standpoint and indicates that some traditionally great teaching hospitals could lower their presently larger ratios with consequent redistribution of funds toward other teaching and research needs without destruction of senior residency standards.

The fewer the ward beds, the more urgent is administrative and geographical centralization by major clinical departments under supervision of the heads of the departments or men chosen for ability in senior residency teaching. One of the problems of the private service house officer is that he may be responsible to a dozen attending men for 25 beds distributed through every floor and wing of the hospital. Centralization of ward beds gives a hospital a chance to study what centralization moves may prove timesaving teaching aids for the private services. Some men as they grow older and gain influence in a hospital manage to be relieved of much teaching work while keeping ward beds under personal jurisdiction. If a department's handful of ward beds is distributed between a half a dozen such jurisdictions, the chances of good senior residencies are slight. Independent action can be defeated by the necessity for multiple daily arrangements.

When, by reason of staff or finances, a private hospital cannot afford a minimal-sized ward service, affiliation with a publicly supported hospital can fill the lack. Some public and private institutions have been able to pool their characteristic resources in a successful cooperative program from the intern through the senior resident levels instead of having multiple programs inadequate in one or more features and in mutual competition. The history of educational affiliation between public and private institutions is characterized by wide variation in local practice and by many variations over the years. In some areas medical education has prospered by reason of stability of these relations; in others it has suffered as greatly for lack of them. It takes firsthand familiarity to grasp why these affiliations have proved so difficult some places but so fruitful when once established in others. This familiarity is needed to develop a workable plan free of obvious pitfalls for a given institution. Representative of some important new types of affiliation are the taking over of all operations of the municipal hospital in Nashville, Tenn., by Vanderbilt University (J. B. Youmans, M.D., dean) at a time when many Vanderbilt University Hospital beds have been converted to private use; the assignment of certain senior surgical fellows at the Cleveland Clinic (S. O. Hoerr, M.D., in charge of surgical education) to the Cleveland City Hospital for senior ward work (F. Simeone, M.D., chief of surgery). The Michigan plan of rural hospital and university hospital affiliation should also be considered.[10]

Often a city hospital staff will ask a private hospital seeking affiliation, "What can you offer us?" This has to be answered for success. Often with a little exploration, it can be. Research facilities are an example. When Francis Peabody [11] set up an investigative group under private auspices, with research laboratories and a small research ward in the midst of a great city hospital, he made a great contribution to the training of practicing physicians as well as of research men.

The aim is not to make a research laboratory of the hospital. To have a research program going side-by-side with patient care can breed an atmosphere of diligence and inquiry in clinical work that is hard to achieve in formal instruction. The critique (not the techniques) of investigation can be infectious and of lifelong value in practice. Given an institution-wide understanding that "applied research" is not always the most productive of truly valuable results, the presence of the urgency of disease close to the scientist's laboratory is a valuable

9. Armstrong, S. H., Jr.: Private Patients in Medical Teaching, Tr. Am. Clin. & Climatol. A., vol. 63, 1951.

10. Wilkinson, C. F.: The General Practitioner: How to Create More of Him for the Future Needs of the Country, J. A. M. A. **137**: 945-948 (July 10) 1948.

11. Peabody, F. W.: The Physician and the Laboratory, in Doctor and Patient, New York, Macmillan and Company, 1930, chap. 3.

prophylaxis against the artificial atmosphere of some isolated research institutes. Few city hospitals can provide such facilities with their own resources.

Thus the laboratories of the private hospital, often more extensive than those permitted by many municipal or county budgets, can truly implement the clinical care and basic medical facilities the latter provide. So also can its few ward beds, in giving special care when needed for special problems. Moreover, a private hospital, even in these tax-ridden days, has opportunities to seek financial support not always open to the municipal hospital directly and which are greatly strengthened by the latter's reservoir of clinical material. If, however, research is often used to enhance standing in competitive practice, resultant feeling may hurt the program. There may come a belief that the laboratory advantages of services staffed by a private teaching hospital will put other city hospital services in an unfavorable light or compete for staff with the research programs already set up within the city hospital. Any or all of these feelings, if sufficiently intense, can block fruitful collaboration. If the men on the affiliated services behave in a friendly and appreciative fashion and invite collaboration with other services when feasible, the adverse feelings we have described may dwindle to insignificance over a few years.

STAFFING THE PRIVATE TEACHING HOSPITAL

Given a city hospital affiliation for the senior residency, the core of a private hospital's teaching is still its own private services. A first-class service chief and house staff can maintain a high teaching standard on a public ward, even if some of the attending men give only minimum service required for patient care. For a private service, an enthusiastic chief and a keen house staff are not enough. Teaching enthusiasm and ability are needed in each private attending man.

When a service falls down in teaching performance, word goes from intern to prospective intern and from resident to prospect resident. With today's excess of house staff positions over candidates, a long time can be needed to reverse the trend of the service's drawing power. Though scarcely in a position to determine their curriculum, students and house staff are rarely deceived about the sincerity, interest, and intellectual integrity of their teachers.

So this question comes up: "Does a man uninterested in or incapable of teaching have a place on a private teaching service?" If staff selection is based on appraisal of long-term teaching promise in addition to usual bases of professional skill and loyalty, a hospital will face this question rarely.

Of great value in selection is a research program, backed by locally administered part-time fellowships. A private hospital with a clinical and scientific staff, chosen with consideration of cooperative work, has real investigative as well as educational value. Although few hospitals can afford research departments in all preclinical or clinical fields, many can afford one department with a creative scholar in charge, e. g., in pathology. The situation of the Presbyterian Hospital in Chicago is of interest (G. M. Hass, M.D., chief of pathology, D. A. MacFadyen, M.D., chief of biochemistry, and J. A. Campbell, M.D., chief of medicine). Having recently set up fundamental investigative laboratories on a scale rare among private hospitals with few public ward beds, it now faces the problem of comparable clinical facilities to give maximum use of its superb scientific plant in training practicing doctors and investigators. Though it is obvious that certain types of research are out of place at a private hospital, one of the greatest clinical investigators of our age, Sigmund Freud, worked almost exclusively with private patients. In investigative work, private hospitals face problems that a hospital with a public ward service under central direction does not. These arise from both the necessary admitting practices of the private hospital and from the occasional divergences in considerations of patient care from the standpoint of the private physician and scientific critique from the standpoint of the clinical investigator. With a staff united in purpose they can often be solved.

Local management of part-time fellowships permits local analysis of misuse that is not always possible with national full-time appointments. If a man expands his practice to the neglect of a paid part-time opportunity for teaching or research, this can be observed better with local administration than by a conference 5 to 10 years later to wrestle with the inadequate teaching function of his many beds. Most existing fellowships on a national or university level (such as the fellowships under the National Research Council, the U. S. Public Health Service, the Rockefeller Foundation, and the scholarships of the John and Mary Markle Foundation) are aimed at the development of the full-time teacher and investigator, not the teaching practitioner.

It is not easy to select men for teaching and research. One can be fooled by early adherence to the outward precepts of medical scholarship, which can cover a pervading paralysis of independent thought or action. On the other hand, when an able man (whose thirties are devoted to the demands of a young family and a confiscatory income tax rate) turns in his forties to the scholarly side of medicine, he often does more for teaching than the man whose encyclopedic knowledge has been acquired largely from books. The problem is finding this man in his burdened years—in differentiating him from the man whose practice, however large, is never quite large enough.

I have seen splendid teachers in 50-bed rural hospitals as well as in great medical centers. Nearly every man is a teacher of some effectiveness by the end of his house staff service. Then suppose he becomes an assistant in a very busy office and at the same time is given a dispensary morning assignment of students. He begins with enthusiasm. On busy days, he arrives at his private office late, sometimes without lunch, to find a full waiting room and his seniors or associate asking where he has been. Then he leaves this office late, misses dinner in handling the evening house calls, and comes home late to find his wife with the same question. Five years of this can put him in a bad teaching position unless his senior partners make certain that he has time to teach, read, and do some independent work. They are as responsible as he for his own development and for the teaching program of the hospital.

Whether through lack of time or of inclination, when the young man fails to study as he sees patients, he cannot keep up with advances in medicine; clinically immature students sometimes find themselves better prepared in the theory of medicine. It takes a lot of demonstrable practical sagacity to retain the respect of the students in this situation.

If several such young men become valuable private office assistants for capable senior teachers who try to secure permanent staff appointments for them, the finest of laboratories, full-time men, or research funds cannot offset the damage to the teaching program.

A lay board of managers or the administration of affiliated universities can help in setting standards, but within limitations. The lay board members of private hospitals are open to private persuasion by staff physicians who care for them and feel a serious conflict of loyalties in making decisions against the wishes of their own physicians. The occasional lay board member who makes an independent study of the processes of medical education can be of great service to a teaching program. This takes both devotion to duty and time, which is as valuable to business men as to physicians. Teaching is a collaborative job rarely fruitfully forced from the "outside," as by administration, and when it is forced, the relationship is unstable. Even when universities own hospitals, this is not always a sure safeguard against either exploitation or stagnation.

A private hospital should be prepared to provide beds for moderate-sized practices of some of an affiliated university's key investigative clinicians. (The hospital staff must insist on proper qualification for practice. More than one able scientist with a degree of doctor of medicine has been tempted to enter a clinical field without adequate training.) Because there exist rare instances of failure of function of whole clinical departments when one or two salaried staff members exploit practice privileges in competition with private physicians, to the neglect of teaching and research, it is essential to define borderlines between legitimate use and exploitation that will be valid locally.

Today many a full-time teacher in the old-fashioned sense is forced by family pressure to seek a source of additional income beyond his university salary. Salaries, particularly at the associate professor level, were barely adequate a decade ago and have not increased commensurately with taxes and inflation. The simplest administrative safeguard against exploitation of practice privileges is the setting of a maximum amount that a man can earn and the insistence on periodic reports. Any flagrant abuse is usually obvious.

Hospital staffs, which are self-perpetuating by promotion of faithful assistants, do not always welcome independent appointments by university authorities. If the staff depends on independent practice, behind such resentment is fear that a new man appointed for educational reasons (particularly if appointed at a top level) will use his teaching or research prominence to take over part of existing staff practices. It is important that full-time educators act in such a way as to make these fears groundless.

If a university depends completely on appointments of persons emerging from an entrenched clinical faculty (whether in private or institutional practice), the danger of self-perpetuation into mediocrity remains. The history of medical education is marked by many a battle between a university aiming at top educational standards and a staff aiming at preservation of seniority privileges. For every stalemate many superb collaborations have emerged. If a hospital staff is able to take the responsibility of examining its own appointments in the light of teaching and research, a university is wise to make clear its educational criteria, examine carefully and independently the men proposed, appoint those who fulfill them, and reject those who do not, with explicit statement of reasons, and go no further. Indeed, a few private hospitals with loose university affiliations have implemented this ideal by appointment of committees outside their own staff, including representatives of the basic sciences, to select key staff replacements. This is done at the Massachusetts General Hospital, Boston, Dean Clark, M.D., medical director.

When a university gives an initial three year appointment, it usually reviews the record before the end of that time. In many private hospitals the usual one year staff appointment given by the lay board is subject to renewal year after year without scheduled academic review. When private hospitals and universities affiliate, sometimes the university mistakenly takes the hospital's one year to mean a single year and therefore waives its own reviewing function. It is critically important for the private teaching hospital to inform every new man that initial staff appointments and academic rank are subject to joint review at stated periods and are mutually dependent.

If a university finds a hospital staff as a unit cannot meet its standards, often a very satisfactory distribution of good teaching services can be achieved by supporting individual services in several hospitals (good examples of this can be seen in certain private hospital services affiliated with Northwestern University in Chicago). Cumbersome as this arrangement may sound administratively, when the university influences only those services interested in its work and takes no part in the other services of a hospital, friction in hospital-university relations is often minimal. When a university takes over the function of supplying a house staff to approved services in several hospitals, it moves by hospital default into a central role in postgraduate medical education in addition to its traditional undergraduate role.

The final responsibility, however, for use of private beds in medical education belongs mainly to the private physicians. They become associated with teaching programs because of teaching interests and they seek to perpetuate their interest by staff recruitment. This is facilitated in communities where there are enough private beds; physicians without intense interest in teaching can voluntarily become associated with other hospitals without loss of efficiency in service to patients.

SUMMARY AND CONCLUSIONS

For teaching purposes it makes no difference whether the patients are in private rooms with baths or in 20 bed wards or whether their hospital charges and professional fees are paid by private insurance, the patients themselves, or public authorities if the following criteria are met:

1. The patients present the range of serious disease the young physician will meet later on. 2. The house staff and students can follow the course of the patients after discharge. 3. The staff members love to teach, realize that teaching takes valuable time and do not begrudge it, and cherish the continually broadening viewpoint arising from day after day exchange with younger colleagues. 4. The staff members are secure enough in relationships with patients to share responsibility with junior colleagues. 5. The staff members are sensitive to the difference between mere training and true education. Education presupposes training in the accepted concepts and procedures of the day and goes further in encouraging the student to explore and to face revisions with equanimity.

At the end of hospital training, when a real degree of skill and experience has been achieved, the senior resident is ready to take charge of his own group of patients in the teaching hospital. (In the surgical specialties this includes actual operating not merely serving as first assistant, and in the medical specialties the major diagnostic and therapeutic decisions.) For these functions, private patients pay their private physicians not hospital residents. Here private services cannot completely supplant the public wards.

A few private services over the country satisfy these criteria. Their teaching performance is attested by their popularity in attracting house staffs. Many do not. However good their educational programs look on paper, a few hours in the house staff dining room, a few days visiting the actual teaching exercises, and some hours on rounds with the attending staff disclose problems of patient population and in follow-up continuity, of attending staff selection and in provision of proper facilities for their practice and research to implement teaching, and of the necessity for a minimal ward service under central departmental control for senior residency training.

Most difficult of all are problems of physician-physician relationships. Their solution is critical to the success of the private service in the sharing and delegation of clinical responsibility essential for development of clinical maturity. The complexity of these difficulties leads me to feel that the success of the public ward system in teaching performance will not be matched by all private services in the near future.

Much of the working out of problems will depend on local conditions, such as whether the private hospital staff is open or closed, whether the supply of private beds meets demand, whether city hospitals welcome close teaching affiliations in a senior residency program, and whether private hospitals can give the city hospitals equal advantages in such an arrangement.

Success will depend on the persistence of those who believe in the role of private institutions in medical education. An old-fashioned public ward service can work well with a keenly interested chief and a handful of capable attending men as a faculty. Its capacity to give independent action to its house staff can offset many indifferent teachers. A private service can work well only if all persons involved understand the goal, want it, and will work for it.

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FATAL STAPHYLOCOCCUS ENTERITIS FOLLOWING PENICILLIN AND STREPTOMYCIN THERAPY

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and
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Fatal Staphylococcus enteritis following antibiotic therapy is now a familiar entity,[1] but its clinical picture and its exact relation to the several antibiotics remain to be clarified. Three cases of this entity were autopsied and are reported, with emphasis on the following aspects: 1. The clinical picture of this complication that can appear very soon after antibiotics are given and that may follow a fulminating course demands prompt therapeutic action. 2. All three of these patients received only penicillin and dihydrostreptomycin intramuscularly, in contrast to reports in the literature [1] in which aureomycin and oxytetracycline (Terramycin) administered orally have generally been the offending agents. 3. Some observations on pathogenesis are discussed.

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1. (*a*) Jackson, G. G., and others: Terramycin Therapy of Pneumonia: Clinical and Bacteriological Studies in 91 Cases, Ann. Int. Med. **35**: 1175 (Dec.) 1951. Womack, C. R., and others: Terramycin Therapy of Urinary Tract Infections, A. M. A. Arch. Int. Med. **89**: 240 (Feb.) 1952. (*b*) Dearing, W. H., and Heilman, F. R.: Micrococcic (Staphylococcic) Enteritis as a Complication of Antibiotic Therapy: Its Response to Erythromycin, Proc. Staff Meet., Mayo Clin. **28**: 121 (March 11) 1953.

Also described are two cured patients in whom the clinical picture was identical to that of the patients who died. Staphylococci were not cultured from the stools in these patients; but, in each case, throat and stool cultures showed abnormal flora. The concept that this complication arises from a suppression of the normal intestinal flora, which then permits the ever-present staphylococci to thrive to a pathogenic degree, seems oversimplified.

REPORT OF CASES

CASE 1.—A 22-year-old white woman was hospitalized for exodontia and died six days later from fulminating enteritis. During the summer of 1952 this patient had been thoroughly studied because of a persistent mildly febrile illness, with no intestinal symptoms and with negative stool culture. The illness was considered probably to be rheumatic fever. The eventual autopsy did not yield any explanation of this illness.

The woman's dental condition was poor. After she seemed almost recovered from the mild febrile illness, she was admitted to the hospital for exodontia that was performed uneventfully on Nov. 28, 1952. Procaine penicillin G, 400,000 units, and dihydrostreptomycin, 1 gm., were given intramuscularly twice daily for five days, from Nov. 25 through

Nov. 29, 1952, as prophylaxis. On Nov. 30, the patient was discharged from the hospital feeling well. She was afebrile. On the day after discharge, nausea, occasional vomiting, malaise, periumbilical discomfort, and diarrhea, with two to three watery stools per day, developed. Three days after discharge, her temperature had risen to 104 F, and she was readmitted to the hospital. Her rectal temperature on admission was 106 F; pulse, 130 per minute; and blood pressure, 90/60 mm. Hg. The patient was lethargic, had constant liquid stools, and soon became semicomatose. The hematocrit was 44%, and the white blood cell count was 6,100 per cubic millimeter, with polymorphonuclears, 85%, lymphocytes, 9%, monocytes, 3%, and eosinophils, 3%. Urinalysis showed specific gravity, 1.020; albumin, 3 plus; no sugar; and coarsely granular casts, with a few red and white blood cells in the sediment. A blood culture was sterile. Nose and throat cultures on Dec. 3, 1952, yielded 4 plus growth of hemolytic Staphylococcus aureus.

The patient was given fluids intravenously, two intramuscular injections of procaine penicillin G, 400,000 units, and dihydrostreptomycin, 1 gm., and an intramuscular injection of cortisone. She rapidly grew worse. Six hours after admission, her blood pressure had dropped to 50/26 mm. Hg, and 12 hours after admission she died.

At autopsy, two and one-half hours after death, the gastrointestinal tract was contracted and devoid of normal content. The lumen of the upper small intestine, particularly, contained an elastic but friable semitranslucent mucoid material that formed a cast of the lumen and rugal folds. This material was present in the stomach, where it formed an incomplete cast. The colon was empty, and the mucous membrane was moist and hyperemic, but not ulcerated. The mucous membrane of the stomach, duodenum, and ileum was swollen and congested and showed small points of superficial erosion. Other body viscera showed congestion but no significant pathological changes.

Postmortem bacteriological study showed that the blood in the heart was sterile. The nasal sinuses contained proteus vulgaris and nonhemolytic streptococci. The small intestine yielded a pure culture of hemolytic Staph. aureus (coagulase positive), but no gram negative organisms were present. The colon yielded a pure culture of hemolytic Staph. aureus (coagulase positive). Microscopic examination of the stomach and small intestine, particularly, and, to a lesser degree, of the colon showed an intense congestion of the mucosa, with edema and inflammatory infiltration. The inflammatory reaction consisted of polymorphonuclear neutrophils, plasma cells, lymphocytes, and histiocytes. In some areas, these extended through the muscularis. In many places, there was superficial loss of surface epithelium. A marked proliferative mitotic activity of the glandular epithelium was present. The luminal cast was composed of interlacing, pink-staining strands and a finely granular ground substance that contained cellular debris and a moderate leukocytic infiltration throughout. Periodic acid and aniline water (Gram-Weigert) stains indicated that the cast was composed mainly of fibrin with a small amount of mucus enmeshed. The most striking feature was the presence of numerous colonies of staphylococci.

Case 2.—A 52-year-old white man had a subtotal gastrectomy on Jan. 15, 1953, because of a benign gastric ulcer. The patient was in good general health. His history, physical examination, and routine blood and urine studies indicated nothing abnormal. His blood pressure on admission was 140/94 mm. Hg. A gastric analysis showed 7 units of free acid before and 39 units after histamine was administered. Because of its high position on the lesser curvature, the ulcer was left in situ (after biopsies were reported benign), while two-thirds of the stomach was resected. The operation was uneventful; later autopsy confirmed the fact that no surgical complications had arisen.

On the first postoperative day, the patient received 400,000 units of procaine penicillin G and 1 gm. of dihydrostreptomycin intramuscularly at 8:00 a. m. and no other antibiotics on this day. When it was discovered that this man had a history of sensitivity to penicillin, this drug was not given again after the initial dose; thereafter, he received streptomycin alone. During the first postoperative day, his rectal temperature was between 100 and 101 F. His condition was satisfactory. On the second postoperative day at 8:00 a. m., the temperature was 101.4 F, and the pulse rate showed a sudden rise to 120 per minute; this was just 24 hours after the first injection of penicillin and dihydrostreptomycin. The second injection, of streptomycin alone, was not received until 1:00 p. m. on the second postoperative day. During this day, diarrhea began, with eight copious liquid stools in the 24 hour period. At 4:00 p. m., the rectal temperature was 103.4 F. The patient looked and acted well and stated that he felt fine. The lungs were clear to physical examination. On this day, the man received 1 gm. of streptomycin intramuscularly at 1:00 p. m. and at 9:00 p. m.

On the third postoperative day, the patient's temperature was between 105 and 105.8 F. In the morning, it was noted that he still did not appear very sick. The diarrhea continued with seven copious liquid stools. The chest was normal. The white blood cell count was 3,200 per cubic millimeter, with 89% polymorphonuclears. Blood culture made on this day was normal. Stool culture showed Esch. coli, nonhemolytic streptococci, but no enteric pathogens; it had been seeded on only the usual enteric medium, not including a blood agar plate. Streptomycin, 1 gm. intramuscularly, was given at 9:00 a. m. and 9:00 p. m. In the evening of the third postoperative day, the patient began to vomit, and it was evident that he was critically ill. On the assumption that he had sepsis of undetermined type, aureomycin was given intravenously. The patient received 5.5 gm. of aureomycin intravenously during the next 60 hours, with no evident change in his condition. On the next day, the temperature ranged to 103.6 F, and the diarrhea continued with six watery stools, a total volume of approximately 3,000 cc. The blood pressure fell as low as 60/40 mm. Hg during part of this day. The man received 1 gm. of streptomycin intramuscularly at 9:00 a. m., and intravenous administration of aureomycin was continued.

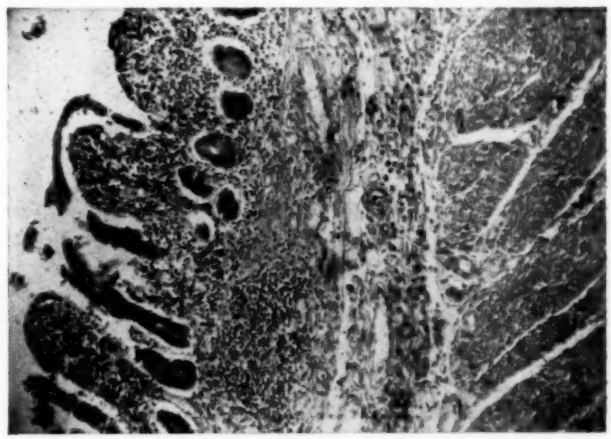

Fig. 1.—Photomicrograph showing infiltration and disruption of intestinal mucosa (case 2).

On the fifth postoperative day, the rectal temperature reached 103.6 F. The diarrhea ceased. The patient was critically ill, and his blood pressure remained at shock levels during most of this day. The white blood cell count was 13,000 per cubic millimeter, with 95% polymorphonuclears. Nonprotein nitrogen determination was 105 mg. per 100 cc. The patient's urinary output was 1,850 cc. on the first, probably normal (bathroom privileges) on the second, not known on the third, and reduced to 40 cc. and 75 cc., respectively, on the fourth and fifth postoperative days. This oliguria was presumably due, at least in part, to hypotension. A moderate deficit of sodium was evident, but deranged fluid and electrolyte balance

did not seem severe enough to account for any important part of the patient's illness. On the fifth day after surgery, the patient received 1 gm. of streptomycin intramuscularly at 9:30 a. m., and intravenous administration of aureomycin was continued. The patient died at 4:00 a. m. on the sixth postoperative day.

At autopsy, two hours after death, the recent subtotal gastrectomy wounds were intact, without leakage, and with an adequate gastroenterostomy stoma. The peritoneal reaction was slight and consisted of delicate fibrinous adhesions without purulent exudate. There remained a 2 cm. indurated ulcer on the lesser curvature, 1 cm. from the cardia. The margins were sharp and not thickened. The duodenal limb and the entire small intestine were distended. The wall was thickened and edematous. The intestine contained light yellow, semifluid, mucoid material, and the mucous membranes were congested, edematous, and hemorrhagic. No blood was present in the intestinal lumen. The colon showed a similar, though less marked, reaction. No ulcerations or any formed fecal material were present. Other organs were moderately congested, but without other contributory pathological changes.

Postmortem bacteriological study showed that the blood in the heart was sterile. In the small intestine, hemolytic Staph. aureus (coagulase positive) was the predominating organism.

Fig. 2.—Photomicrograph showing proliferative activity of glandular epithelium (case 2).

Nonhemolytic Streptococcus was present, but there were no organisms of the colon group. Organisms in the colon were similar to those in the small intestine. On microscopic examination, the intestinal mucosa was congested, edematous, and diffusely infiltrated with plasma cells, lymphocytes, and a few polymorphonuclear cells in focal areas. The glandular epithelium was degenerated in isolated glands but, for the most part, showed proliferative mitotic activity. The histology of the small intestine is shown in figures 1 and 2. It was entirely similar in the other two autopsies. The stomach and colon showed similar though less intense changes. The other organs showed acute inflammatory bronchitis but no other significant abnormality.

Case 3.—A 61-year-old white man was admitted to the hospital on Jan. 23, 1953, for revision of an ileostomy. He had had chronic idiopathic ulcerative colitis of 18 months' known duration. Nine months before admission, an ileostomy was performed at another hospital because of profuse rectal bleeding. His general condition had improved greatly after this operation, with a weight increase from 110 to 138 lb. (49.9 to 62.6 kg.). The ileostomy had, however, been placed so near the iliac spine that no apparatus could be made to fit it. There was constant leakage and soiling, which was particularly bothersome at night. The patient had had a coronary occlusion two years before admission and anginal symptoms for five years. He was being maintained on digitalis, but there had been no frank episode of congestive failure. Although his cardiac condition clearly increased the risk of surgery, his situation had become intolerable to him, and revision of the ileostomy was considered necessary. Because of marked pathological changes in the colon, with pseudopolyposis, it was decided to perform a partial colectomy at the time of this operation. These procedures were carried out on Jan. 27, 1953.

On the day before operation, the patient received 400,000 units of procaine penicillin G and 1 gm. of dihydrostreptomycin intramuscularly in the morning and evening. On the day of operation, he received one such injection, and 1 gm. of streptomycin and 500,000 units of penicillin were placed in the peritoneal cavity. For the next eight days (through the eighth postoperative day), the man received two intramuscular injections daily of 400,000 units of procaine penicillin G and 1 gm. of dihydrostreptomycin. On the eighth, ninth, and tenth postoperative days (beginning after the onset of small bowel distention and ileostomy diarrhea), he received a total of 1.75 gm. of oxytetracycline orally. On the 11th and 12th days after surgery, he received no antibiotics. On the 13th postoperative day, he received one intramuscular injection of 300,000 units of procaine penicillin G.

The patient appeared to be doing well for three days after surgery. On the fourth postoperative day, he vomited several times, and there was moderate abdominal distention. During the next two days, symptoms and signs developed that were thought to be indicative of small bowel obstruction, with distended loops of small bowel visible roentgenologically. A Miller-Abbott tube was passed satisfactorily with free drainage, but it was noted that distended loops of small bowel were still present proximal to the tip of the tube, indicating paralytic ileus rather than mechanical obstruction. Copious green liquid drainage from the ileostomy was first noted on the seventh postoperative day. It continued copiously until death, or shortly before. Ileostomy drainage on the 11th postoperative day was 6,450 cc. On the 12th postoperative day, a physician recorded that there was "frank blood . . . and shaggy exudate" draining from the ileostomy. Fever was not present until the 12th postoperative day when the rectal temperature rose to 102.8 F and to 105 F the next day. Stool culture (from the ileostomy) on the 13th postoperative day showed 2 plus growth of hemolytic Staph. aureus (coagulase positive).

The patient's downward course was accompanied by progressive nitrogen retention and by moderate deficits in electrolyte concentrations. On the day before death, the blood nonprotein nitrogen was 68 mg. per 100 cc.; serum sodium, 126.5 mEq. per liter; serum potassium, 5.5 mEq. per liter; chloride, 83 mEq. per liter; serum albumin, 3.9 gm. per 100 cc.; and globulin, 3 gm. per 100 cc. On the 11th postoperative day, the blood pressure dropped to 80/70 mm. Hg. It was maintained at somewhat higher levels thereafter with the aid of vasopressor drugs; but for the last three days of illness, there was a state of semishock with marked oliguria. The patient died on the 14th postoperative day.

At autopsy, performed three hours after death, the operative wounds (revision of ileostomy and right hemicolectomy) were healing and without inflammatory reaction. The heart weighed 490 gm., and there was left ventricular hypertrophy. An old 7 cm. fibrous scar on the anterior aspect of the myocardium largely replaced the musculature. Posteriorly, a recent yellow-red infraction extending 3 cm. was seen. The left anterior descending coronary artery showed an old recanalized occlusion while the left circumflex artery, 3 cm. from the bifurcation, contained a recent thrombus. In the gastrointestinal tract, the esophagus and stomach were normal. The mucosa of the duodenum, jejunum, and ileum was edematous and congested. Petechial hemorrhages were present in the mucosa, diminishing in frequency in the lower intestine. The intestinal content was yellowish-brown and mucopurulent. In the portion of the colon and rectum remaining, the wall was thickened and the mucosa scarred, edematous, hemorrhagic, and covered with a mucoid material typical of chronic ulcerative colitis. Other body viscera were noncontributory. The kidneys weighed

300 gm. and had a smooth capsule and distinct corticomedullary markings.

Postmortem bacteriological study showed that the blood in the heart was sterile. In the ileum, hemolytic Staph. aureus (coagulase positive) was the predominating organism; there was a moderate growth of yeast cells and an occasional colony of Esch. coli. The colon yielded hemolytic streptococci (coagulase positive) but no gram negative organisms. Microscopic study of the ileum showed edema, congestion, and inflammatory infiltration with lymphocytes, plasma cells, and, in focal areas, polymorphonuclear cells. There was epithelial proliferation with mitotic activity. In the colon, fibrous mucosal and submucosal scarring was present together with moderate inflammatory reaction. The heart sections revealed acute and chronic myocardial damage. A peribronchial alveolar inflammatory infiltration was present.

CASE 4.—Shortly after the patient in case 2 died, an identical condition developed in another patient, a 61-year-old man who also had just had a subtotal gastrectomy. The operation had been uneventful. Beginning on the day of operation, the patient received 400,000 units of procaine penicillin G and 1 gm. of dihydrostreptomycin intramuscularly twice daily. On the next day, the patient had a rectal temperature of 102 F, which rose to 103.8 F on the second and third postoperative days. On the third postoperative day, diarrhea commenced with six to eight liquid stools per day for the next three days. Meanwhile, the patient looked and felt surprisingly well, as had been true also of the patient in case 2. With fever of 103.8 F in a postoperative patient, one is ordinarily inclined to begin, or to increase, antibiotic therapy. In view of recent experience, however, all antibiotics were discontinued early in the fourth postoperative day. The striking cessation of fever and diarrhea that followed is shown in figure 3. The patient thereafter recovered uneventfully.

Stool cultures (including blood agar plates in each instance) were performed from the second through the seventh and on the tenth day after the beginning of diarrhea. At no time did they show staphylococci. Esch. coli was present in all specimens. There was an abnormally abundant growth of enterococci beginning on the fifth day, and this was still present on the tenth day after the beginning of diarrhea (the latter culture was grown nine days after antibiotics were discontinued and six days after diarrhea had ceased). Cultures from the throat and sputum on the fifth postoperative day showed 2+ and 4+ growths of Staph. aureus, respectively.

CASE 5.—A 61-year-old white man had an uneventful herniorrhaphy on March 31, 1953. Subsequently, a barium enema was performed because of a history of lower abdominal symptoms. The enema led to the discovery of what proved to be a subacute appendiceal abscess. On operation on April 10, 1953, it was necessary to do a partial colectomy to remove the inflammatory mass. In the 24 hours following this operation, the patient received two intravenous injections of 0.5 gm. of oxytetracycline. He received no other antibiotics at any time. None were given at the time of the previous herniorrhaphy.

On the second postoperative day (24 to 36 hours after the beginning of administration of oxytetracycline), the patient's temperature rose to 104.6 F rectally, and watery diarrhea, 11 stools with a total volume of approximately 3,000 cc., began. Peristalsis was hypoactive, and there was moderate abdominal distention despite the fact that a Miller-Abbott tube had been inserted immediately after operation. The white blood cell count on the first postoperative day was 14,200 per cubic millimeter, with 84% polymorphonuclears. Blood culture taken at the peak of fever was normal.

Treatment consisted of discontinuing the antibiotic and of close attention to maintenance of fluid and electrolyte balance. Eight hours later, the man's temperature had dropped to normal, and it remained so. Diarrhea lessened on the third postoperative day, although it did not cease until the sixth postoperative day. The stool volumes on the third, fourth, and fifth postoperative days were 1,700, 805, and 935 cc., respectively. During these days, the patient made steady improvement but was still fairly sick as indicated by weakness, nausea, hypoperistalsis, and mild abdominal distention despite the Miller-Abbott tube. Thereafter, recovery was uneventful.

The patient's blood pressure was well maintained throughout. There was no azotemia; the serum nonprotein nitrogen was 40 mg. per 100 cc. on the third and 26 mg. per 100 cc. on the seventh postoperative day. Urinalyses, however, on the third and fourth postoperative days showed 4 plus albuminuria, with occasional white and red blood cells in the sediment but no casts. Urinalyses before operation and on the sixth and seventh postoperative days were entirely normal. Cultures of the pharynx and the stools (including blood agar plates) were taken on the evening of the second postoperative day (48 hours after the first of the two doses of oxytetracycline). The pharynx at this time showed a pure growth of Proteus vulgaris; the stool showed almost pure growth of the same organism, with no Esch. coli present. Proteus vulgaris from

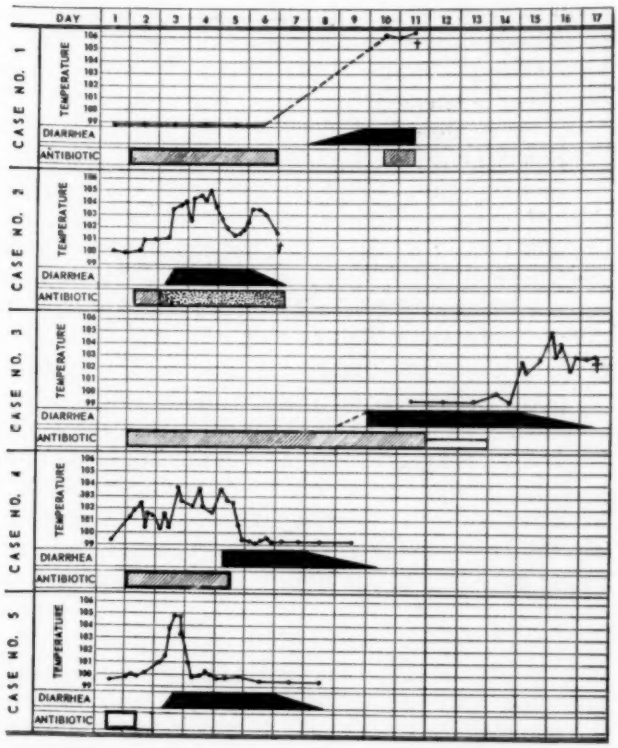

Fig. 3.—Postoperative courses of patients in case reports: cross-hatched rectangles indicate duration of therapy with penicillin and dihydrostreptomycin; stippled rectangles, dihydrostreptomycin only; and white rectangles, oxytetracycline (Terramycin) only. Solid areas indicate presence of diarrhea.

the pharynx was sensitive to chloramphenicol (Chloromycetin) and slightly so to dihydrostreptomycin. It was not sensitive to oxytetracycline or aureomycin. Pharyngeal cultures on the fourth and seventh postoperative days still showed pure growth of Proteus vulgaris. Stool cultures showed pure growths of Proteus vulgaris on the second, third, and fourth postoperative days with some Esch. coli present for the first time on the sixth postoperative day. Stool cultures on the 11th postoperative day still showed abundant Proteus vulgaris together with Esch. coli. No staphylococci were found at any time.

The illness of these two patients (in cases 4 and 5) appeared to be clinically identical with that seen in those that at autopsy were found to have Staphylococcus enteritis. In both instances, throat and stool cultures showed an abnormal flora, although staphylococci were found only in the throat cultures in case 4 and not at all in case 5. Hence it is considered that the illness of these two patients was due to toxins produced by intestinal bacteria under the influence of antibiotics.

COMMENT

Autopsy in each of the patients who died showed severe enteritis as the cause of death, with abundant and pure growth of hemolytic Staph. aureus in postmortem cultures from the bowel. All patients except one received combined procaine penicillin G and dihydrostreptomycin intramuscularly.

Fever and diarrhea were the cardinal clinical features at the onset of this condition. Two patients appeared strikingly well, clinically, during the first few days of this fatal complication, even though there was fever of 102 to 104 F and death was to ensue in four days. Shock, oliguria, and azotemia were prominent features in the later course in those patients who died. Diarrhea or fever began in these five cases on the second, third, seventh, and ninth days, respectively, after the beginning of administration of the antibiotic (fig. 3), and death occurred on the fourth, fifth, and eighth days after the onset of fever or diarrhea. Death appears to have been due to toxemia, not septicemia, since blood cultures during life and at post mortem were normal and since there was no evidence of pyemia.

The treatment of this condition includes the recognition of the complication as a possibility when unexplained fever or diarrhea develops in any patient receiving antibiotics. Recognition should be followed by prompt withdrawal of the antibiotics and, perhaps, by the use of an antibiotic to which most staphylococci in the patient's geographical area are known to be sensitive; for example, the use of erythromycin has recently been reported.[1b] In two of the present three cases, the Staphylococcus grown post mortem was not sensitive to penicillin, streptomycin, aureomycin, or oxytetracycline but was sensitive to chloramphenicol and magnamycin. The third organism was not tested. Because of the fulminating character of the illness, therapy should not be deferred until the results of cultures or sensitivity tests are known. Clinical recognition may be delayed by the fact that stool cultures during the first days of diarrhea may show normal flora and no staphylococci. This fact is supported by a sixth patient, seen more recently, in whom stool culture on the second day of diarrhea showed normal flora and no staphylococci. Twenty-four hours later, a stool culture showed pure growth of hemolytic Staph. aureus, with no Esch. coli present. The patient recovered. The dramatic termination of fever in cases 4 and 5 on discontinuance of the antibiotics suggests the advisability of a brief trial of this measure alone, if the patient is not in critical condition. The associated disturbance in fluid and electrolyte balance demands prompt and careful attention.

Simple suppression of intestinal flora permitting overgrowth of the Staphylococcus or possibly of other organisms does not seem sufficient explanation of this complication. Other factors might include the introduction of a particular strain of staphylococci or a direct stimulation of toxin production by staphylococci under the influence of antibiotics. The onset of fever and diarrhea as early as 24 hours after antibiotics were first given strongly suggests a stimulating action by these drugs rather than an effect secondary to suppression of the normal intestinal flora. This view is strengthened by the fact that in all cases the drugs were given parenterally only and by the fact that early cultures failed to show staphylococci. That antibiotics can stimulate growth of bacteria in vitro has been demonstrated.[2] Chronic upper respiratory infection, achlorhydria, and cessation of food intake are other factors that might influence changes in intestinal flora. Their role in these cannot be determined.

This condition should be considered not as Staphylococcus enteritis, but as toxicity from disturbed intestinal ecology. It should be emphasized that its manifestations include not only enteritis but systemic toxic effects such as hypotension and azotemia and also that the exact role of the Staphylococcus in this disturbance is not yet clear.

SUMMARY AND CONCLUSIONS

Three autopsied cases of fatal Staphylococcus enteritis occurring after prophylactic use of penicillin and dihydrostreptomycin are presented, together with two cases in which prompt discontinuance of antibiotics was followed by recovery from what appeared to be an identical condition.

The concept that this complication is due to suppression of normal intestinal flora permitting pathogenic overgrowth of intestinal staphylococci appears to be oversimplified. A direct stimulation of the Staphylococcus by antibiotics must be considered. Fever or diarrhea appearing in a patient receiving antibiotics should immediately suggest this complication. Prompt discontinuance of antibiotics and attention to fluid and electrolyte balance are the primary therapeutic measures.

80 Seymour St. (Dr. Kendall).

2. Prissick, F. H.: Antibiotic-Resistant Staphylococci and Related Infections, Am. J. M. Sc. **225**: 299 (March) 1953.

Penicillin.—In the early days of penicillin the manufactured product was very impure and sometimes gave considerable pain on injection. To counteract this, procaine was often mixed with the penicillin solution in the syringes. Sometimes, it was noticed that a precipitate formed, but this did not affect the potency of the penicillin.

Later it was found that procaine formed with penicillin a salt that was only slightly soluble in water and, when introduced into the body as a suspension, was slowly dissociated. As with the oil-wax mixture, a dose of 300,000 units persisted in the blood for 24 hours. It was found also that if aluminum monostearate were added to the oily suspension of procaine penicillin the dissociation was further delayed so that a single dose would last for three days. Procaine penicillin made the treatment much easier for both doctor and patient, but the slow absorption meant that there was never a high concentration in the blood. To overcome this drawback, soluble sodium penicillin was often given in combination with the relatively insoluble procaine salt. This ensured a high initial concentration in the body, together with a long-continued action. More recently other salts of penicillin have appeared.

Diethylaminoethyl-ester hydroiodide of benzyl penicillin is a sparingly soluble salt that forms a depot like the procaine salt. Its peculiarity is that it appears to have an affinity for the inflamed lung and appears in much higher concentration in the sputum. This should be of advantage in the treatment of lung conditions.—Sir Alexander Fleming, The Shattuck Lecture: Twentieth-Century Changes in the Treatment of Septic Infections, *The New England Journal of Medicine*, June 18, 1953.

TREATMENT OF ACTINOMYCOSIS WITH ISONIAZID

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The remarkable development of antibiotics and chemotherapeutic agents in recent years has resulted in improved methods of treatment in many infectious diseases; however, despite exhaustive clinical and laboratory investigations, many fungous infections continue to be generally fatal.[1] The commonest of these diseases is actinomycosis.[2] Although radiation therapy and surgery [3] are of value in localized actinomycotic infections, the sulfonamides and penicillin provided the greatest improvement in the prognosis of this mycotic disease.[4] Nonetheless, even with these agents the morbidity and mortality remained significant.[5] Recently aureomycin was demonstrated to be effective in the treatment of this condition.[6]

While searching for an inexpensive, effective, and nontoxic therapeutic agent for use in actinomycosis, isoniazid (Nydrazid) was considered. Isoniazid was recently demonstrated to be of value in tuberculosis.[7] Inasmuch as it has long been recognized that the tissue reaction and clinical picture in tuberculosis and actinomycosis are very similar,[8] it was decided to investigate the action of this agent in actinomycotic infections. The present paper constitutes a report of isoniazid therapy in three cases of localized actinomycosis.[9]

REPORT OF CASES

CASE 1.—A 9-year-old Negro girl was observed in the Antibiotic Clinic of the John Gaston Hospital and the University of Tennessee College of Medicine on June 2, 1952. This patient was referred by the Pediatric Clinic because of a persistent cutaneous lesion overlying the right mandible, of about three years' duration. In April, 1949, this patient had a severe toothache in the right lower jaw. All discomfort disappeared without dental treatment in three days; however, within a week an area of painless and nontender induration developed over the right lower jaw and persisted unchanged until May 14, 1952. Thereafter, progressive swelling was observed associated with moderate tenderness and trismus. On May 17, 1952, the lesion drained spontaneously, and the child was brought to the Pediatric Clinic of the John Gaston Hospital. No clinical improvement followed the administration of 2 gm. of sulfadiazine daily for a week. Therefore, the patient was referred to the Antibiotic Clinic for fungal studies.

Examination on June 2, 1952, revealed a chronic granulomatous lesion of woody consistency overlying the right mandible (fig. 1*A*). The area of involvement measured 2.6 by 2 cm. in diameter. A small amount of thin, yellowish material was draining from the orifice of a sinus located toward the periphery of the lesion. It was possible to pass a small probe along this sinus tract for a distance of 1.4 cm. There was no extension of the process into the oral cavity. A moderate degree of trismus restricted the separation of the anterior teeth to 2.9 cm. Dental consultation and roentgenologic studies revealed a periapical abscess about the roots of the right first molar tooth. No other abnormality was noted. Examination of the seropurulent material draining from the sinus disclosed the characteristic sulfur-like granules of Actinomyces bovis. The diagnosis of actinomycosis was subsequently confirmed by microscopic and cultural methods.

Isoniazid therapy was begun on June 12, 1952, in a dose of 300 mg. per day; 100 mg. was administered every eight hours. Inasmuch as the child weighed 73 lb. (33.2 kg.), this was approximately 9 mg. per kilogram of body weight per day. Because of the possibility of toxic effects resulting from dosage of this magnitude in such a young person, the patient was carefully examined each week in the Antibiotic Clinic, with especial attention being focused on the nervous system. In addition, comprehensive hematological, hepatic, and renal studies were made at weekly intervals. Slow but progressive improvement was noted. By July 16 (after five weeks of treatment), the area of involvement was sharply circumscribed and measured only 0.5 by 0.4 cm., the anterior teeth could be separated 3.6 cm., and the only complaint was intermittent mild pruritus about the lesion. Nevertheless, a small amount of thin purulent material continued to exude from the sinus orifice, and a culture obtained on July 3 yielded A. bovis; however, no sulfur granules could be detected. Since no toxic effects had been noted, it was decided to double the amount of medicament and to observe the child every other day. Rapid improvement ensued. By Aug. 19 it was possible to discontinue medication, inasmuch as the lesion had entirely epithelized, and the patient was completely asymptomatic. Only a small area of induration marked the location of the previous lesion (fig. 1*B*). On Sept. 28, the first right molar tooth was extracted without difficulty and with no sequelae. This patient has now been observed for six months and shows no evidence of recurrence of infection. In vitro sensitivity studies made with the organism isolated from this patient demonstrated a definite inhibitory effect by isoniazed on this strain of A. bovis (see table).

Sensitivity of Actinomyces Bovis to Isoniazid

Case in Which Strain of A. Bovis Was Taken	Days After Inoculation	Micrograms of Isoniazid per Cubic Centimeter of Medium					
		3,125	1,562	780	390	195	98
1	3	—	—	—	—	—	+
	7	—	—	—	—	+	+
	14	—	—	—	+	+	+
2	4	—	—	—	+	+	+
	5	—	—	+	+	+	+
	14	—	—	+	+	+	+
3	4	—	—	—	—	+	+
	5	—	—	—	—	+	+
	14	—	—	—	—	+	+

— denotes inhibition.
+ denotes lack of inhibition.

The white blood cell count ranged from 12,000 to 7,400 per cubic millimeter, and the hematocrit from 35.5 to 40%. Urinalyses were persistently within normal limits. The sedimentation rate (Wintrobe, corrected) varied from 0.9 to 0.4 mm. maximal fall per minute (Rourke-Ernstene technique), the blood nonprotein nitrogen from 25 to 31 mg. per 100 cc., and the total protein from 6.6 to 7.9 gm. per 100 cc. with albumin from 4.2 to 5.2 gm. per 100 cc. and globulin from 2.4 to 2.8 gm. per 100 cc. Total serum bilirubin ranged from from 0.2 to 0.28 mg. per 100 cc.; sulfobromophthalein (Bromsulphalein) retention (after 45 minutes and with 5 mg. per kilogram of body weight intravenously) was 0 to less than 5%; cephalin-cholesterol flocculation tests were persistently 0 at 24 hours; and total plasma cholesterol from 122 to 172 mg. per 100 cc. with the cholesterol esters from 48 to 82%. Three cultures were negative for tubercle bacilli; the intradermal tuberculin test (purified protein derivative—first strength) was negative at 48 hours, but the second strength

E. R. Squibb & Sons, New York, supplied the isoniazid (Nydrazid) used in this study.

Because of lack of space, the bibliographic references have been omitted from THE JOURNAL and will appear in the authors' reprints.

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purified protein derivative tuberculin test resulted in 1+ at 48 hours. A chest roentgenogram was interpreted as being within normal limits.

The clinical response and the in vitro sensitivity studies in this case indicate that isoniazid is effective in localized actinomycosis. It would appear that larger amounts of medicament are required in actinomycosis than in tuberculosis. Had 600 mg. (18 mg. per kilogram) been administered from the beginning of treatment, a more rapid clinical response probably would have occurred. Although this 9-year-old child received 30 gm. of isoniazid over a period of 67 days, no toxic effects were observed.

CASE 2.—A 69-year-old Negro woman was referred from the General Medicine Clinic to the Antibiotic Clinic of the John Gaston Hospital on June 10, 1952, with the complaint of a mass in the neck. Approximately four weeks previously the patient noted a slight swelling in the left supraclavicular space. During the ensuing week, there was a marked increase in the size of the lesion and the area became moderately tender and warm to the touch. Very little change was noted in the following three weeks. There were no chills, no weight loss, no weakness, and no anorexia. No history could be elicited of trauma, syphilis, upper respiratory infections, or contact with tuberculosis. Examination revealed a mass in the left supra-

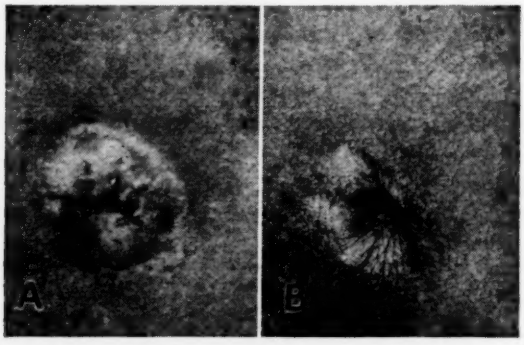

Fig. 1.—Chronic granulomatous lesion overlying the right mandible in case 1, before (*A*) and after (*B*) isoniazid therapy.

clavicular space extending upward over the lateral aspect of the base of the neck. This lesion measured 2.2 by 3 cm. in its greatest diameter and was moderately tender and warm on palpation. A small fluctuant area was present along the medial border of the mass. No other significant findings were observed.

The fluctuant area was aspirated by aseptic technique, and about 2 cc. of rather thin, brownish-yellow material was obtained. Sulfur-like granules were readily demonstrated. Subsequently bacteriological studies yielded Mycobacterium tuberculosis and A. bovis. After aspiration chronic drainage developed.

Isoniazid therapy was begun on Aug. 7, 1952. This patient was treated entirely on an ambulatory basis, since hospitalization was refused. It was decided to administer 800 mg. of isoniazid daily—200 mg. four times a day. Inasmuch as the patient weighed 125 lb. (56.8 kg.), this was 14.1 mg. per kilogram of body weight per day. Because of the amount of medicament employed, the patient was observed every third day and comprehensive laboratory examinations were obtained to detect any evidence of toxicity. There was rapid clinical improvement. By Aug. 21 (two weeks after the institution of treatment), all drainage had ceased and there had been a marked reduction in the size of the lesion. Neither heat nor tenderness could be detected on physical examination of the lesion. Inasmuch as the patient's only complaint was moderate dizziness, treatment was continued. Two weeks later (Sept. 4), epithelization was complete. In addition to the dizziness, which had remained unchanged, the patient now complained of a slight tingling sensation in the fingers and toes; all reflexes were normal, and no neurological abnormality could be detected. Medication was discontinued on Sept. 16. On that date only a small area of induration was present. The patient was entirely asymptomatic and had gained 2 lb. (0.9 kg.) while under treatment. In vitro sensitivity studies using the strain of A. bovis isolated from this patient demonstrated a definite antagonistic action by isoniazid (see table).

The white blood cell count ranged from 10,200 to 8,400 per cubic millimeter with persistently normal differential determinations, the red blood cell count from 4,180,000 to 4,420,000 per cubic millimeter, and the hematocrit from 37 to 40%. All urinalyses were within normal limits. The sedimentation rate (Wintrobe, corrected) ranged from 1.4 to 0.9 mm. maximal fall per minute (Rourke-Ernstene technique); the blood nonprotein nitrogen from 29 to 25 mg. 100 cc.; total protein from 6.8 to 7.2 gm. per 100 cc. with albumin from 4.1 to 3.7 gm. per 100 cc. and globulin from 2.7 to 3.5 gm. per 100 cc.; cephalin-cholesterol flocculation from 0 to 2+ at 24 hours; and total plasma cholesterol from 156 to 119 mg. per 100 cc. with cholesterol esters from 68 to 75%. The Kahn blood test was negative. The intradermal tuberculin test (purified protein derivative—first strength) was 2+ at 48 hours. Two chest roentgenograms were interpreted as being within normal limits.

Isoniazid was apparently the drug of choice for the treatment in this case, inasmuch as it was effective against both the tubercle bacillus and A. bovis. Although this patient received 14.1 mg. per kilogram per day of isoniazid for 42 days (a total of 33.6 gm.), no significant toxic effects were noted. Mild dizziness was experienced on the sixth day of treatment and persisted unchanged; mild tingling in the extremities developed during the third week of therapy. Both of these side-effects disappeared within two weeks after medication was discontinued. There has been no evidence of recurrence of infection in the five months since the completion of therapy.

CASE 3.—A 29-year-old Negro man was referred from the Orthopedic Clinic to the Antibiotic Clinic of the John Gaston Hospital and the University of Tennessee College of Medicine on June 25, 1952, because of a chronic lesion involving the right zygomatic area of the face. This patient had been hospitalized in the Orthopedic Service from Feb. 11 to March 1, 1952, after an automobile accident in which he sustained a comminuted fracture of the upper one-third of the shaft of the right tibia, a simple fracture of the right fibula, a fracture of the transverse process of the fourth lumbar vertebra, brain concussion, and multiple lacerations of the face and lip. While in the hospital he received 300,000 units of penicillin intramuscularly each day. Shortly after being discharged in March, the patient noted an area of nonpainful and nontender swelling, which involved the right superior portion of the face. During the latter part of May facial tenderness developed, and he was referred to the General Surgery Clinic, where the clinical impression was cellulitis of the face. This resulted in his admission to the Surgical Service of the John Gaston Hospital on June 3, 1952. Incision and drainage were performed on June 5. This procedure was reported to reveal a deep lying abscess over the right zygomatic process, which contained approximately 10 cc. of purulent necrotic material. From June 3 to June 5, the patient received 300,000 units of penicillin intramuscularly every 3 hours and 0.5 gm. of streptomycin every 12 hours; from June 6 until he was discharged (June 11), medication consisted of 100,000 units of penicillin every 3 hours and 0.5 gm. of streptomycin every 6 hours; thereafter, until the patient was seen in the Antibiotic Clinic, he was given 4 gm. of sulfadiazine daily (total of 60 gm. orally). Inasmuch as tenderness and swelling persisted, the patient was referred to the Antibiotic Clinic for further studies.

Examination on June 25 revealed an indurated area of woody consistency that measured 6.5 by 5 cm. overlying the right zygomatic area and extending superiorly almost to the lower eyelid. Minimal trismus was present. A moderate amount of seropurulent material was draining from a sinus tract

located in the line of the previous incision and drainage. Gross and microscopic examination of this exudate revealed numerous sulfur-like granules. A culture of this material yielded A. bovis.

The patient was immediately given isoniazid, 700 mg. per day. Since the weight was 165 lb. (75 kg.), this constituted 9.3 mg. per kilogram of body weight per day. Gradual but definite improvement was observed and by July 17 (22 days after the institution of therapy) all drainage had ceased. No tenderness was present, and the anterior teeth could be separated 5.2 cm.; however, the patient complained of severe nausea associated with the ingestion of the medicament. Nausea was said to occur regularly about 5 minutes after medication and to persist for 10 to 15 minutes. The presence of food in the stomach markedly reduced the nausea. Vomiting did not occur. Isoniazid therapy was discontinued on July 24 after 28 days of treatment, inasmuch as the lesion had apparently epithelized and the supply of medicament was temporarily exhausted. Nine days later (Aug. 2) a painless, slightly tender area was observed approximately 0.5 cm. below the right eye. Needle aspiration of this area was carried out with aseptic technique, revealing a minute amount of yellowish material. Immediate gross and microscopic examinations revealed atypical granules. The filaments comprising these sulfur-like granules were quite loosely arranged, suggesting some degenerative action (fig. 2). No growth occurred in culture. Since the patient was quite depressed and no isoniazid was immediately available, he was given aureomycin, 3 gm. daily for 10 days and then 2 gm. for 18 days. By Nov. 10, 1952, epithelization was complete and no swelling or tenderness was present. In vitro sensitivity studies using the organism obtained from this patient again revealed a definite inhibitory action by isoniazid against A. bovis (see table).

The white blood cell count ranged from 10,200 to 6,000 per cubic millimeter, and the hematocrit from 41 to 45%. Repeated urinalyses were within normal limits. The sedimentation rate (Wintrobe, corrected) ranged from 1.4 to 0.6 mm. maximal fall in 1 minute (Rourke-Ernstene technique); the blood nonprotein nitrogen from 29 to 33 mg. per 100 cc.; total serum bilirubin from 0.28 to 0.84 mg. per 100 cc.; and total protein from 7.3 to 7.6 gm. per 100 cc. with albumin from 4.2 to 4.6 gm. per 100 cc. and globulin from 2.7 to 3.2 gm. per 100 cc. The cephalin-cholesterol flocculation test was persistently 0 at 24 hours, and total plasma cholesterol varied from 162 to 198 mg. per 100 cc. with cholesterol esters from 50 to 71%. The Kahn blood test was negative, as was the intradermal tuberculin test (purified protein derivative—first and second strengths). Comprehensive roentgenologic examinations were nonrevealing.

This patient received much less isoniazid than did the other two patients, only 19.6 gm. as compared with 30 gm. and 33.6 gm., respectively. Nevertheless, gradual but definite evidence of improvement was observed. The morphological alteration of the sulfur-like granules demonstrated after the administration of isoniazid and the fact that A. bovis could not be cultured at the time of relapse are most interesting. Again, no significant toxic effects were noted.

COMMENT

In this era of antibiotic and chemotherapeutic agents, the fungous diseases have become increasingly important. In all probability their relative resistance to modern methods of treatment has been a factor in this development. In the past the diagnosis of fungous infections was often academic, but with the development of more effective therapeutic regimens prompt diagnosis is important. The current literature mirrors the greater frequency with which these diseases are being considered and diagnosed. Certainly, the laboratory procedures required for an unequivocal diagnosis of these infections necessitate some degree of training but are not overly difficult, time consuming, or expensive.

The commonest of the highly fatal mycotic infections is actinomycosis.[2] The exact incidence of this condition is not known, but it cannot be extremely rare, since 10 cases were observed at the John Gaston Hospital and the University of Tennessee College of Medicine in the past three years. It would appear that actinomycosis is frequently not considered and so is often misdiagnosed. In case 1, the patient had been observed by numerous physicians for three years and yet fungous diseases had not been investigated. Similarly, case 3 was regarded as a chronic pyogenic infection. These two cases emphasize the fact that actinomycosis should be considered in the differential diagnosis of all subacute and chronic inflammatory processes in which the etiological agent is not readily obvious; especially is this indicated if the cervicofacial area is involved and if there is a preceding history of trauma. Undoubtedly numerous patients with actinomycosis have been diagnosed as having tuberculosis; frequently microscopic and bacteriological procedures are required to differentiate these conditions. In case 2 both infections were present.

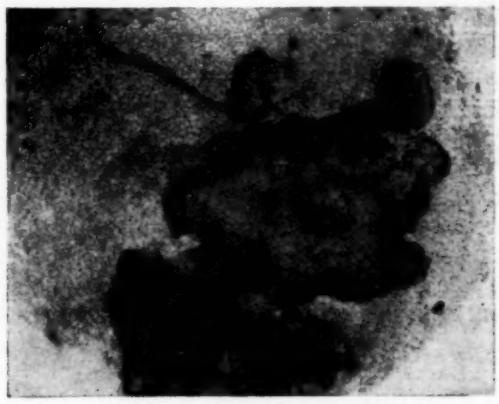

Fig. 2.—Sulfur-like granule in case 3.

Surgical procedures and radiation therapy have proved to be of value in localized actinomycosis.[3] More recently the sulfonamides, penicillin, and aureomycin have been shown to be effective in both localized and disseminated forms of this disease.[9] Even so, treatment has remained prolonged, expensive, and far from uniformly successful.

In view of the reported value of isoniazid in tuberculosis (a disease in many ways similar to actinomycosis), this agent was investigated in the treatment of actinomycosis.[7] In vitro studies with three strains of Actinomyces bovis demonstrated a definite inhibitory effect by isoniazid. Similarly, in vivo results with this agent were most encouraging. It appears that much larger doses must be administered in actinomycotic infections than are usually employed in tuberculosis; instead of 2 to 4 mg. per kilogram of body weight per day, 10 to 18 mg. per kilogram per day seems to be indicated. If smaller amounts of medicaments are administered, improvement is very gradual and recurrence is likely. This is illustrated by case 3 and the initial treatment of case 1. With doses up to 18 mg. per kilogram per day, no evidence of significant toxicity was observed over a period of 4 to 10 weeks.

Side-effects consisted of dizziness, tingling in the extremities, anorexia, and nausea. Whether a more prolonged course of therapy would have resulted in increased toxicity is uncertain. Obviously, until more is known concerning isoniazid, patients receiving such dosage should be carefully observed. A review of the current literature suggests that neurological disease, a history of emotional instability or of psychotic episodes, or evidence of serious renal or hepatic disease might contraindicate the use of isoniazid. No patient in the present series received isoniazid until a thorough history and physicial examination had essentially eliminated neurological disease. Likewise, renal and hepatic function were determined prior to treatment. The one therapeutic failure in this study occurred in a patient (case 3) who received only 9.3 mg. per kilogram per day of isoniazid for a period of 28 days (a total of 19.6 gm.). The other two patients received 30 gm. and 33.6 gm. over a period of 67 and 42 days, respectively. It is realized that the follow-up periods in the three cases reported in this study are quite brief and that prolonged observation is necessary; however, the in vitro studies and initial clinical results indicate that isoniazid is of value in the treatment of actinomycosis.

SUMMARY

In vitro studies demonstrated an inhibitory effect by isoniazid (Nydrazid) against three strains of Actinomyces bovis. Encouraging clinical results were obtained in three cases of cervicofacial actinomycosis. No significant toxic effects were observed. A definite evaluation of the effectiveness of isoniazid in the treatment of localized and disseminated actinomycosis will require the prolonged observation of a large series of cases.

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CONTROLLED ERGOMETRIC STUDIES OF EFFECT OF HEPARIN ON INTERMITTENT CLAUDICATION

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and
Irving S. Wright, M.D., New York

Clinical experience has demonstrated the need for an accurate method for the determination of claudication time.* The subjective report of the patient with intermittent claudication is frequently extremely variable and has proved unsatisfactory for the evaluation of therapy in occlusive vascular disease. The time of onset of claudication pain may be influenced by the rate of walking,[1] the gradient of the incline on which the walking is done, and psychological factors. Patients frequently report variations in claudication time apparently related to environmental temperature or humidity.

Interest in this subject was renewed following the report of Graham and co-workers,[2] later confirmed by Engelberg,[3] suggesting that intermittent heparin administration resulted in relief of angina pectoris in patients with coronary arteriosclerosis. Recognizing the difficulty in evaluating the effect of any treatment for angina as well as the basic similarity of angina and claudication,[4] we have endeavored to determine objectively whether heparin would alter the development of intermittent claudication in patients with arteriosclerosis of the lower extremities. More recently Engelberg and Massell [5] have reported marked improvement in level walking tolerance in 8 out of 10 patients with peripheral arteriosclerosis receiving heparin therapy. In this study there was no control period of placebo therapy and no mention is made of the method used to maintain a constant rate of walking during the various tests.

Other studies concerned with the measurement of intermittent claudication have utilized a variety of types of apparatus, including a foot treadle ergometer [1] and a bicycle ergometer.[6] With the latter techniques the rate of exercise was regulated by a metronome. Rhythmic faradic stimulation of the leg muscles has been used to control the rate and strength of muscle contraction.[7] It seemed advisable to eliminate voluntary control of the rate of muscular contraction but to allow the subject to utilize his normal gait. An electrically driven treadmill ergometer was therefore constructed.

METHOD

A treadmill consisting of a 14 in. wide endless rubberized canvas belt on wooden rollers was activated by a ¼ h. p. alternating current electric motor. These two units were coupled by means of a variable speed belt drive, a fixed ratio reduction gear drive, and a chain drive, which transmitted the power to rollers at both ends of the treadmill. Both the treadmill and the power unit were mounted on a stable platform, the surface of the treadmill being level. On either side of the treadmill,

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* For this study the definition of claudication time was that point at which walking was no longer possible because of the severity of cramps, aching, or extreme fatigue in the muscles of one or both legs.

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5. Engelberg, H., and Massell, T. B.: Heparin in the Treatment of Advanced Peripheral Arteriosclerosis: Preliminary Report, Am. J. M. Sc. **225**: 14, 1953.

6. Texter, E. C., Jr.; Redisch, W., and Steele, J. M.: Induced Intermittent Claudication, Am. J. M. Sc. **222**: 653, 1951.

7. Hitzrot, L. H.; Naide, M., and Landis, E. M.: Intermittent Claudication Studied by a Graphic Method, Am. Heart J. **11**: 513, 1936.

separated by 24 in., guide bars were placed at a level convenient to the hands of the subject being tested. Along these guide bars sliding tubes were placed and connected to pull switches in such a fashion that a short backwards pull by either of the subject's hands would either start or stop the motor (fig. 1). The speed of the treadmill surface could be varied from 70 to 210 ft. per minute. When the variable speed drive was locked, the speed,

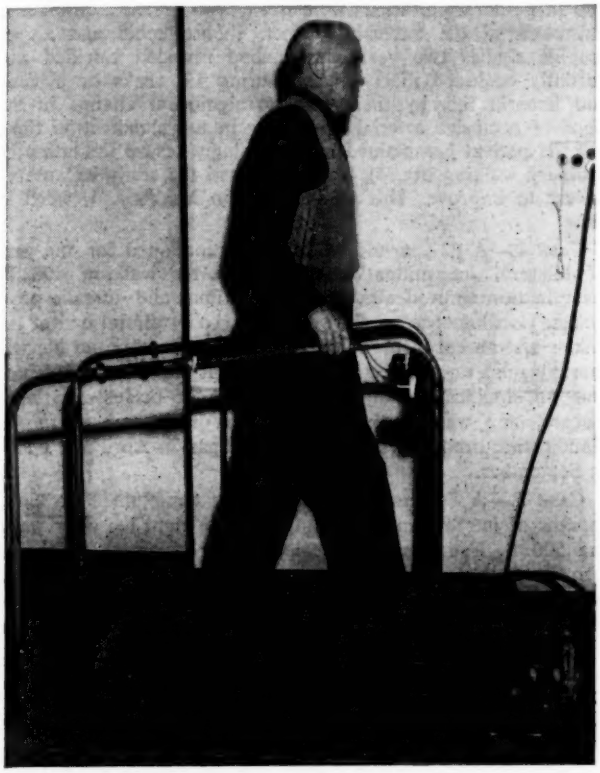

Fig. 1.—Subject walking on treadmill ergometer. The right hand is in position to activate the pull switch.

as determined by mechanical counter and stop watch, was found not to vary to any significant degree under loads ranging from none to 250 lb. (113.4 kg.), or with ordinary variations in line voltage. The apparatus was placed in a quiet examining room in such a way that the test subject faced a blank wall while walking.

The subject was tested at approximately the same hour (usually 9 a. m.) of the same day of each week. Rarely two or three weeks passed between tests. After sitting quietly for 30 minutes, he was told to mount the treadmill, start it himself, and walk as long as he could. In these studies the speed of the machine was set at 140 ft. per minute, at which rate intermittent claudication always developed. When the subject could no longer walk because of claudication, he stopped the machine by pulling the switch at his side. Placebo or heparin was then injected intravenously, and after resting 30 minutes the patient repeated the procedure. The average of the two claudication times was recorded. Except for one observer, the subject was alone in the room. The subject could not see the observer from his walking position, and no conversation was carried on. Time was measured with a stop watch by the observer who did not know which medication was being given, in most instances. The patients were not given information about medication or claudication time. Wrist watches were removed, but one subject (case 6) counted his steps. Medication, given intravenously twice weekly, consisted of isotonic sodium chloride solution, 2 ml., or heparin sodium solution

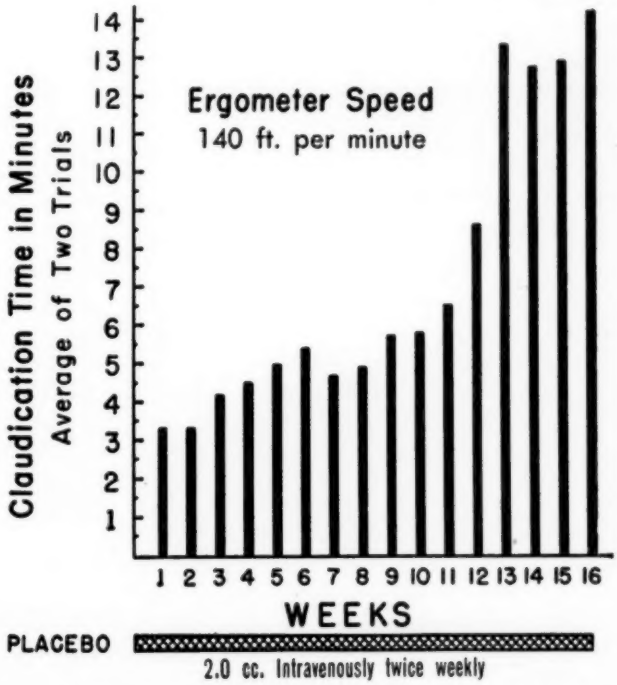
Claudication Time in Minutes
Average of Two Trials
Ergometer Speed
140 ft. per minute
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
WEEKS
PLACEBO
2.0 cc. Intravenously twice weekly

Fig. 2.—Progressive improvement of claudication times of subject in case 1 while receiving only placebo therapy.

(Liquaemin †), 50 mg. of heparin sodium per milliliter of sterile isotonic solution, 2 ml. The subjects all received two injections each week, whether or not they

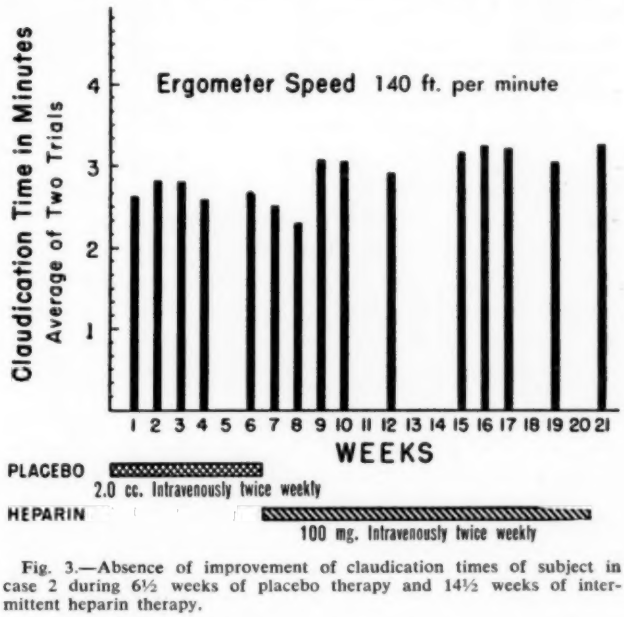
Claudication Time in Minutes
Average of Two Trials
Ergometer Speed 140 ft. per minute
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
WEEKS
PLACEBO
2.0 cc. Intravenously twice weekly
HEPARIN
100 mg. Intravenously twice weekly

Fig. 3.—Absence of improvement of claudication times of subject in case 2 during 6½ weeks of placebo therapy and 14½ weeks of intermittent heparin therapy.

were tested during that week. All subjects had stopped smoking at least two months before this study began. No medication other than heparin or placebo was given.

The subjects reported in this study were chosen from among the outpatients at the New York Hospital Medical

† Liquaemin is manufactured by Organon Inc., Orange, N. J.

Vascular Clinic. Although the total number, six, is small, it should be noted that each was followed in this study for periods of from 12 to 24 weeks. Data on other subjects on whom observations were made are not included in this report because of inability or unwillingness to come to the hospital twice weekly for a minimum of 12 weeks, a period arbitrarily chosen for inclusion in this report. Two of these latter subjects improved so rapidly while

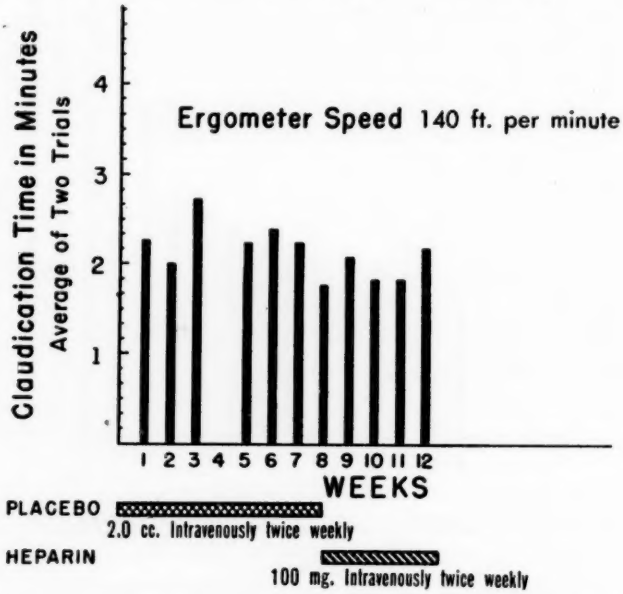
Claudication Time in Minutes
Average of Two Trials
Ergometer Speed 140 ft. per minute
1 2 3 4 5 6 7 8 9 10 11 12
WEEKS
PLACEBO
2.0 cc. Intravenously twice weekly
HEPARIN
100 mg. Intravenously twice weekly

Fig. 4.—Absence of improvement of claudication times of subject in case 3 during eight weeks of placebo therapy and four weeks of intermittent heparin therapy.

receiving placebo that they felt no further need for the frequent visits. All subjects included in this report complained of intermittent claudication after walking short distances. All showed evidences of arterial insufficiency of one or both lower extremities, as manifested by diminished or absent arterial pulsations and oscillometric readings, pallor on elevation, rubor on dependency, and reduced skin temperature. In all cases the diagnosis of arteriosclerosis obliterans was determined by the usual clinical criteria,[1] in some cases confirmed by radiographic and angiographic examination. Patients were excluded if there was evidence or suspicion of thromboangiitis obliterans or embolic arterial occlusion, as were those with skin ulceration, orthopedic or neurological conditions, or cardiac decompensation.

REPORT OF CASES

Case 1.—A 51-year-old white man complained for 15 months of bilateral intermittent claudication after walking 500 ft. Examination revealed absent posterior tibial and dorsalis pedis pulsations and absent oscillometric pulsations at the ankles and feet. On placebo therapy alone he showed striking prolongation of his claudication times (fig. 2) and reported corresponding improvement in his ordinary walking. Oscillometric pulsations appeared at the ankles and gradually increased to about one-half the normal minimum. This study began in October and ended in January.

Case 2.—A 52-year-old white man complained for five years of bilateral intermittent claudication after walking 300 ft. Examination showed only feeble femoral pulsations, markedly diminished oscillometric pulsations below the knees, and absent oscillometric pulsations at the ankles and feet. Three years earlier radiographic and angiographic studies had demonstrated calcified and almost completely occluded terminal aorta and iliac vessels. A bilateral lumbar sympathectomy had been done three years prior to the present study, but there was no improvement. During 22 weeks of placebo and heparin therapy there was moderate subjective improvement, with no significant alteration in the signs of occlusive arterial disease or claudication time (fig. 3). This study began in March and ended in August.

Case 3.—A 51-year-old white woman complained for four years of severe bilateral intermittent claudication after walking 300 ft. Femoral pulsations were weak, with absent oscillometric pulsations at the ankles and feet. Radiographic and angiographic studies two years earlier had revealed calcified and partially occluded iliac vessels. During 12 weeks of placebo and heparin therapy there was no significant change in the signs of occlusive arterial disease or in the claudication time, but the patient complained of increasingly severe limitation of ordinary walking (fig. 4). She abandoned the study because of failure to improve. This study began in March and ended in June.

Case 4.—A 63-year-old white man complained for one year of bilateral intermittent claudication after walking 400 ft. Examination showed absent posterior tibial and dorsalis pedis pulses. Oscillometric readings were markedly diminished at the ankles and absent in the feet. During both placebo and heparin therapy moderate subjective improvement was reported. There was no significant change in the signs of occlusive arterial disease, nor was there any consistent improvement in the claudication times (fig. 5). This study began in April and ended in September.

Case 5.—A 56-year-old white woman complained for three months of intermittent claudication in the right leg after walking 500 ft. Examination revealed absent posterior tibial and dorsalis pedis pulsations on the right. Oscillometric pulsations were markedly diminished at the right ankle and absent in the right foot. Radiographic studies showed calcification of peripheral blood vesseis. Gradual moderate subjective improvement was noted during both placebo and heparin therapy. Oscillometric pulsations improved slightly. Claudication times were more often longer during heparin therapy, but the longest

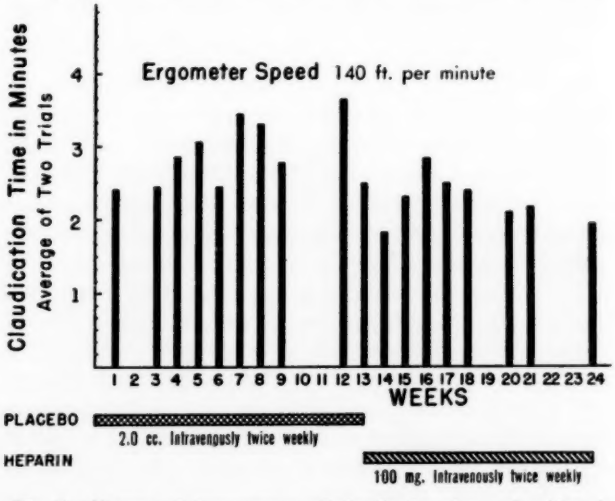
Claudication Time in Minutes
Average of Two Trials
Ergometer Speed 140 ft. per minute
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
WEEKS
PLACEBO
2.0 cc. Intravenously twice weekly
HEPARIN
100 mg. Intravenously twice weekly

Fig. 5.—Absence of improvement of claudication times of subject in case 4 during 13 weeks of placebo therapy and 11 weeks of intermittent heparin therapy.

was not significantly longer than the longest achieved during placebo therapy (fig. 6). This study began in March and ended in August.

Case 6.—A 69-year-old white man complained for two years of bilateral intermittent claudication after walking 500 ft. Examination showed absent posterior tibial and dorsalis pedis pulses. Oscillometric pulsations were markedly diminished below the knees and at the ankles and were absent in the feet. During the period of heparin therapy a gradual subjective improvement was reported, claudication times were longer

(fig. 7), and oscillometric readings were improved. During the second period of placebo therapy further improvement, greater in degree, occurred. These findings were interpreted as indication that the improvement and heparin therapy were probably coincidental rather than related. This study began in September and ended in January.

COMMENT

The precise analysis and control of the multiple variables that determine the time of onset of muscle pain on exercise by subjects with peripheral arteriosclerosis is

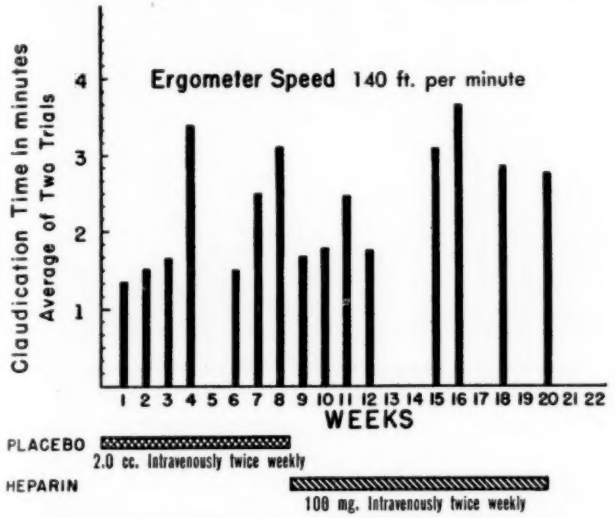
Claudication Time in minutes
Average of Two Trials
Ergometer Speed 140 ft. per minute
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
WEEKS
PLACEBO
2.0 cc. Intravenously twice weekly
HEPARIN
100 mg. Intravenously twice weekly

Fig. 6.—Absence of improvement of claudication times of subject in case 5 during 8½ weeks of placebo therapy and 11½ weeks of intermittent heparin therapy.

beyond the scope of currently available methods of investigation. Although the mechanical aspects of the exercise procedure may be carefully controlled, with minimization of environmental and psychological variables, variability within certain limits must be considered a characteristic finding in studies on intermittent claudication. Despite this limitation, it has been found feasible and desirable to utilize an electrically driven and controlled treadmill ergometer in long-term studies of intermittent claudication.

Important degrees of improvement occurred in the exercise tolerance of patients receiving a placebo (cases 1 and 6). This may be due to a spontaneous occurrence in the course of the arteriosclerotic disease process. It is also possible that collateral circulation has been improved in these subjects in response to repeated tolerance tests with the consequent muscle anoxia. This phenomenon has been postulated as a basic mechanism in the development in intercoronary collateral circulation.[8] In view of the techniques used and the objective evidences of improved peripheral circulation, the psychological effect of treatment was not considered to be a major factor responsible for longer claudication times in these cases.

In other subjects (cases 2 and 4) moderate subjective improvement was reported during placebo and heparin therapy, although there was no significant change in the physical signs of arterial insufficiency, or in the claudication time. In one subject (case 5) moderate subjective and slight oscillometric improvement occurred during placebo and heparin therapy without significant improvement in claudication times. One subject (case 3) experienced increasingly severe subjective symptoms without alteration in physical signs or claudication times.

In none of the five subjects who received intermittent heparin therapy was there a relation of any alteration in subjective symptoms, physical findings, or claudication times to the administration of heparin. The findings of Engelberg and Massell [5] could not be confirmed, probably due to the use of different techniques of study. Similarly, Russek and co-workers [9] have been unable to obtain improvement in anginal symptoms with heparin administration, a finding which coincides with our own.[10] Carefully controlled studies are essential in the evaluation of agents in the treatment of vascular disease. Spontaneous variations in the subjective and objective manifestations of disease, as well as the effects of other coincidental or therapeutic measures, have frequently been mistaken for a specific therapeutic effect of the drug under investigation.

SUMMARY AND CONCLUSIONS

A method for the determination of claudication time in subjects with occlusive arterial disease, utilizing an electrically driven treadmill ergometer, is described. The clinical histories, physical findings, and claudication time records of six arteriosclerotic subjects, with observation periods ranging from 12 to 24 weeks, are presented. The variability of claudication times in the same patient in a controlled situation is illustrated. The potential for significant improvement in the manifestations of arterial

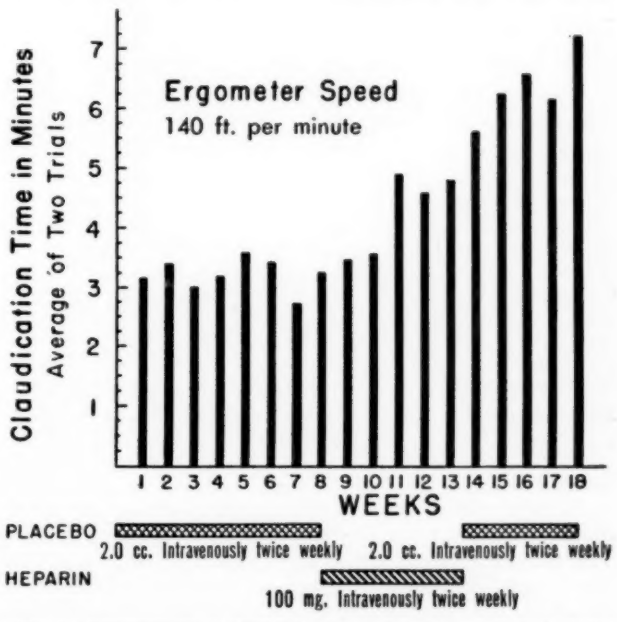
Claudication Time in Minutes
Average of Two Trials
Ergometer Speed
140 ft. per minute
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
WEEKS
PLACEBO
2.0 cc. Intravenously twice weekly
2.0 cc. Intravenously twice weekly
HEPARIN
100 mg. Intravenously twice weekly

Fig. 7.—Improvement of claudication times of subject in case 6 during five and one-half weeks of intermittent heparin therapy and four and one-half weeks of placebo therapy.

8. Zoll, P. M.; Wessler, S., and Schlesinger, M. J.: Interarterial Coronary Anastomoses in the Human Heart, with Particular Reference to Anemia and Relative Cardiac Anoxia, Circulation **4**: 797, 1951.

9. Russek, H. I.; Urbach, K. F., and Doerner, A. A.: Effect of Heparin in Cases of Coronary Insufficiency: Evaluation by Electrocardiographic Tests, J. A. M. A. **149**: 1008 (July 12) 1952.

10. Simon, E. P.: Unpublished data.

disease without treatment, other than abstinence from tobacco, is emphasized. In five arteriosclerotic patients receiving intermittent heparin therapy for periods ranging from 4 to 14 weeks no beneficial effects were observed. Careful control of studies designed to evaluate therapeutic measures for occlusive arterial disease is recommended.

525 E. 68th St. (21) (Dr. Wright).

CLINICAL NOTES

RUPTURE OF A THORACIC ANEURYSM INTO THE STOMACH

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and
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Rupture of an aneurysm of the thoracic aorta into the esophagus is a recognized clinical and pathological entity. Rupture of an aneurysm of the abdominal aorta into the stomach has been reported in at least seven cases. A search of the literature has revealed no report of rupture of a thoracic aneurysm into the stomach. The case we report is a clear example of such an occurrence. Of particular interest is the fact that this case presented symptoms and signs that may be considered diagnostic of rupture of a thoracic aneurysm into the stomach.

REPORT OF A CASE

The patient was a Negro man 61 years of age. His history and that of his family supplied no pertinent information. At noon on the day of admission, severe pain beneath the sternum and in the upper epigastrium developed in the patient. The pain was accompanied by nausea. When the patient arrived in the accident room one hour after the onset of symptoms, he was in shock, with a blood pressure of 60/0 mm. Hg. The skin was cold and clammy. Profuse perspiration was present. A loud systolic murmur was heard over the entire precordium. During the course of the initial examination in the accident room, it was noted that a rapidly expanding tumor mass was developing in the epigastric area. Over the period of a few minutes, the mass was observed to have increased in size. The mass clearly conformed to the outline of the stomach. Shortly after his arrival in the accident room, the patient began to vomit large amounts of bright red blood in a projectile fashion. The patient failed to respond to efforts made to combat anemia and shock, and he died 17 hours after the onset of symptoms.

At autopsy, two saccular aneurysms were found that were both located 3 cm. below the termination of the arch of the aorta (fig. 1*A*). Each aneurysm measured approximately 3 by 2 cm. One was thin walled but intact and had eroded the anterior surface of the fourth thoracic vertebra to about one-third of its depth. The second aneurysm had ruptured into the mediastinum and had dissected its way along the esophagus (fig. 1*B*). At no point had the hemorrhage penetrated the esophageal mucosa. The hematoma was traced down the esophagus to the stomach where it was found to terminate in an irregular opening in the anterior wall of the stomach 3 cm. below the cardiac sphincter (fig. 2). The stomach and duodenum were distended with blood.

Microscopic section of the esophagus showed extensive hemorrhage without penetration of the mucosa. Sections of the aorta were considered typical of syphilitic aortitis. Sections of the mucosal rent in the stomach showed normal gastric mucosa interrupted abruptly by a blood clot that extended through all layers of the stomach.

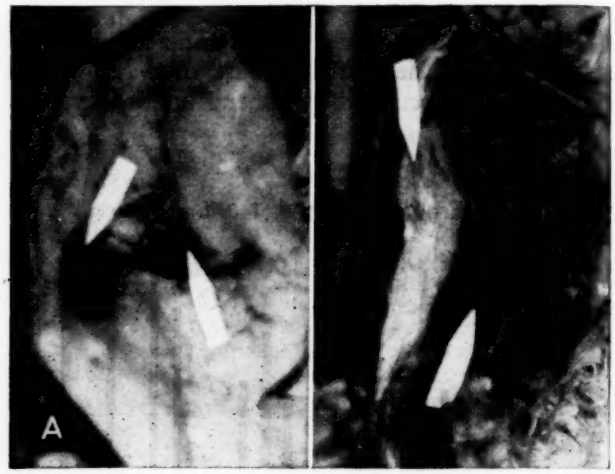

Fig. 1.—*A*, two aneurysms are located in the descending aorta 3 cm. below the termination of the arch of the aorta. The aneurysm to right perforated. *B*, The upper arrow points to the descending aorta; the lower, to the hematoma that dissected its way along the esophagus.

COMMENT

Lemann has made a study of 592 cases in which aneurysms of the thoracic aorta ruptured.[1] In 50, rupture into the esophagus occurred; in none was the rupture into the stomach. Rupture of an abdominal aneurysm into the gastrointestinal tract is rare. In a review of the literature in 1951 by Hirst and Affeldt, only 43 such cases could be found.[2] They added eight cases from a study of 16,633 autopsies. When an abdominal aneurysm does rupture into the gastrointestinal tract, the usual site is the third portion of the duodenum, probably because of its relative fixation. Of the total of 51 cases in which an abdominal aneurysm ruptured into the gastrointestinal tract, only seven ruptured into the stomach.

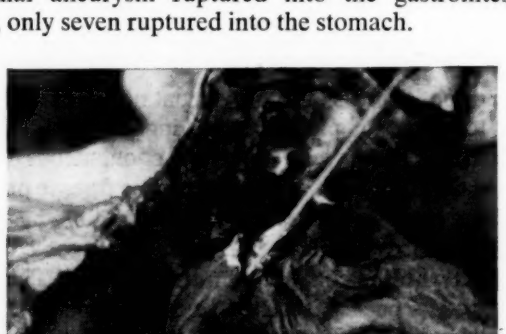

Fig. 2.—The upper pointer is at the junction of esophagus and stomach. The lower pointer is inserted in the site of rupture of the hematoma into the lumen of the stomach.

The occurrence of sudden, severe substernal pain accompanied by shock in an elderly patient invariably brings to the mind of the physician a consideration of acute myocardial infarction, and such was true in the case we report. The progression of events, however,

From the Franklin Square Hospital.

1. Lemann, I. I.: Aneurysm of the Thoracic Aorta, Am. J. M. Sc. **152**: 210, 1916.
2. Hirst, A. E., Jr., and Affeldt, J.: Abdominal Aortic Aneurysm with Rupture Into the Duodenum: Report of Eight Cases, Gastroenterology **17**: 504, 1951.

quickly made this diagnosis untenable. The severe substernal pain correctly indicated the chest as the primary location of the trouble. The vomiting of large amounts of bright red blood indicated a link between the gastrointestinal tract and a blood vessel of considerable size. The rapidly expanding, firm epigastric mass, with the outline of the stomach in an abdomen that otherwise was soft and flat, could only be caused by a large amount of blood gushing into the stomach under pressure. It is difficult to conceive of any other condition than the one found at autopsy that could have given rise to this combination of symptoms and signs. It might be thought that rupture of an aneurysm into the esophagus could give an identical clinical syndrome; however, in the instance of rupture into the esophagus, the action of the cardiac sphincter does not favor retention of blood under pressure in the stomach and consequent distention as is true of rupture into the stomach. In the few detailed case reports of rupture of an aortic aneurysm into the esophagus, that we have been able to find, no mention is made of enlargement of the stomach.[3] Rupture of an aneurysm of the gastric artery is a condition in which blood is introduced into the stomach rapidly and under pressure; however, this condition would not be expected to cause chest pain. Moreover, in three reported cases of rupture of an aneurysm of the gastric artery into the stomach, no gastric enlargement was noted.[4] The occurrence of severe substernal pain of sudden onset, profuse hematemesis, and a rapidly expanding epigastric tumor, conforming to the gross anatomy of the stomach, may, therefore, be considered a diagnostic triad for rupture of a thoracic aneurysm into the stomach.

SUMMARY

Rupture of a syphilitic aneurysm of the thoracic aorta into the stomach is reported.

11 W. 29th St. (18) (Dr. Renner).

3. Spearman, M. P. S.: Traumatic Aneurysm of the Arch of the Aorta with Rupture into the Esophagus, Southwest. Med. **20**: 174, 1936. Funk, E. H.: Aortic Aneurysm with Esophageal Rupture, M. Clin. North America **2**: 795, 1918.

4. Donaldson, G. A., and Hamlin, E., Jr.: Massive Hematemesis Resulting from Rupture of a Gastric-Artery Aneurysm; Report of Three Cases, New England J. Med. **243**: 369, 1950.

CONGENITAL HEMOLYTIC ANEMIA IN NEGRO BROTHERS

REPORT OF TWO CASES

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Prior to 1944, there had been only one recorded instance of congenital hemolytic anemia in the Negro race. That was the case of a Negro woman of "undoubtedly mixed blood" cited by Wintrobe in 1942.[1] In 1945, Scherer and Cecil [2] reported the disease in a 14-year-old Negro girl, and Smith and Drake [3] presented a 22-year-old Negro man. Both the man and the girl underwent splenectomy with good results. A review of the literature reveals that 15 other cases have been reported in the Negro race by various clinicians. In September, 1950, Butterworth, Kracke, and Riser [4] reported two more cases, a woman and her great aunt. To date, a total of 18 cases in 9 families have been reported. Only 5 of the 18 patients had splenectomy, and it is interesting to note that only 4 of those 18 persons were Negro men.

The purpose of this paper is to present two additional cases of congenital hemolytic anemia in Negro brothers, both of whom were treated by splenectomy. Both of the patients in this report showed strong Negroid characteristics, as did their mother. She, however, in contrast to her sons failed to show any enlargement of the spleen, evidence of anemia or reticulocytosis, or increase in blood cell fragility, serum bilirubin, or microspherocytosis

REPORT OF CASES

CASE 1.—A 13-year-old Negro boy was admitted to the hospital on Jan. 15, 1951, because of "big spleen and anemia." The patient had been well until the summer of 1949, at which

Brothers described in case reports after both had undergone splenectomy.

time he began to complain of headache and tiring easily. Thinking the child had "flu" his mother kept him in bed for 10 days, and, after he did not improve, he was hospitalized. The mother was told that the child's blood was "very low" and that he had a big spleen. He was hospitalized for eight weeks and received 11 transfusions of whole blood. After discharge, the boy was checked regularly by his family physician and was found to have a fairly high hemoglobin level and erythrocyte count, with no evidence of jaundice. There had been no history of jaundice, black urine, hematemesis, black or clay-colored stools, or malaria. Family history failed to

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Drs. G. Watson James III, James O. Burke, and Herbert C. Lee, all of the Medical College of Virginia Hospital, assisted in the preparation of this paper.

1. Wintrobe, M. M.: Clinical Hematology, ed. 2, Philadelphia, Lea & Febiger, 1946, p. 492.

2. Scherer, J. H., and Cecil, R. C.: Congenital Hemolytic Anemia in a Negro, J. Lab. & Clin. Med. **30**: 244-246 (March) 1945.

3. Smith, G. T., and Drake, E. H.: Hemolytic Icterus in a Negro Male with Special Reference to the Differential Diagnosis from Bubonic Plague; A Case Report, Mil. Surgeon **95**: 270-272 (Oct.) 1944.

4. Butterworth, C. E., Jr.; Kracke, R. R., and Riser, W. H., Jr.: Hereditary Spherocytic Anemia in the Negro, Blood **5**: 793-797 (Sept.) 1950.

reveal any evidence of jaundice or anemia other than in the patient's brother who was admitted to the hospital the same day. The patient had a tonsillectomy when he was 6, with no postoperative complications.

Physical examination revealed a somewhat thin boy in no distress. There was no suggestion of icterus or anemia. The heart and lungs were normal except for a soft blowing systolic murmur heard over the apex. The spleen was felt 5 cm. below the costal margin and was not tender. The liver edge was felt just below the costal margin on the right side. On the fourth hospital day, a slight fever and some icterus developed. It was thought that a crisis was impending, and there was a drop in the reticulocyte count, but the fever subsided and operation was carried out as planned. The laboratory findings are recorded in the table. The diagnosis of congenital hemolytic anemia was made, and splenectomy was performed on the seventh hospital day. The spleen was removed through a left subcostal incision; it measured 15.5 by 11.5 by 4 cm. The pathologist reported that there was splenomegaly probably due to congenital hemolytic jaundice. The boy recovered uneventfully and was discharged on the 11th postoperative day.

Laboratory Data on Brothers in Cases 1 and 2 Before and After Splenectomy and Data on Patients' Mother

	Case 1		Case 2		
	Before Splenectomy	After Splenectomy	Before Splenectomy	After Splenectomy	Mother
Hemoglobin, gm. per 100 cc.	14.4	14.4	12.2	15.2	15.6
Red blood cells, per cubic millimeter	4,400,000	4,500,000	3,860,000	4,950,000	5,040,000
White blood cells, per cubic millimeter	6,200	13,200	7,600	8,800	6,000
Reticulocyte count, %	13	4	15	0.2	1.8
Platelet count	168,000	1,098,000	224,000	535,000	.....
Sickle cell prep	Negative	.....	Negative	.....	.....
Bleeding time	1'25"	.....	1'50"	.....	.....
Clotting time	4'30"	.....	4'25"	.....	.....
Serum bilirubin, mg. per 100 cc.					
1 min.	0.4	0.2	0.4	0.2	0.2
Total	2.0	0.6	2.4	0.6	0.8
Urine urobilinogen, mg. per day	5.06	0.606	0.609	0.360	.....
Fecal urobilinogen, mg. per day	900	198	869 *	710 *	.....
Red blood cell fragility, % in saline	0.7 to 0.44	0.7 to 0.44	0.7 to 0.44	0.7 to 0.28	0.56 to 0.28
Microspherocytosis	+ †	+	+	+	— ‡
Sternal marrow	Erythroid hyperplasia	.....	Erythroid hyperplasia	.....	.....
Coombs test	Negative	.....	Negative	.....	.....

* Because in case 2 only 5 gm. feces were excreted in 48 hr. preoperatively and 82 gm. postoperatively, these values were calculated as mg. per 100 gm. of feces.
† Present.
‡ Not present.

CASE 2.—An 11-year-old Negro boy was admitted to the hospital on Jan. 15, 1951, because of "anemia and a big spleen." This patient had a history somewhat similar to his older brother's (case 1). Systems review disclosed that he frequently took laxatives for "sluggish bowels." Except for some inability to keep up with his childhood activities, the boy was well until the summer of 1949. Two weeks after his brother had entered a hospital because of "flu," this boy began to complain of weakness, headache, and general malaise. He was found to have anemia and an enlarged spleen and was given 10 whole blood transfusions over an eight week period. After that he felt well until the summer of 1950, when weakness and a low grade fever developed. When jaundice appeared, he was taken to the hospital where he received an additional pint (0.5 liter) of blood. In contrast to his brother, this patient had recently had dark urine. He had had a tonsillectomy at the age of four without complications.

Physical examination revealed a rather chubby-faced boy, with slightly pale conjunctivas and mucous membranes but no visible icterus. The heart and lungs were clear. The spleen was felt 8 cm. below the costal margin on the left side and was much larger and firmer than that of the brother. The liver edge was not felt. The laboratory findings are shown in the table. Splenectomy was performed. The spleen weighed 360 gm. and measured 12 by 14.5 by 4 cm. The pathologist reported that splenomegaly was probably due to congenital hemolytic jaundice. The child had an uneventful recovery and was discharged on the 11th postoperative day (see figure).

COMMENT

Congenital hemolytic anemia in the Negro race was a rare entity until 1944, but, in the last six years, it has become apparent that this disease in the Negro race is recognized more frequently. Because the disease may be benign in itself, splenectomy has been refused in many cases in the past. Only 4 of the 18 previously reported patients were Negro men.

After the diagnosis of congenital hemolytic anemia was made in the two patients described here, splenectomy was performed in both and was followed by the disappearance of evidence of increased hemolysis and reticulocytosis, although microspherocytosis and increased fragility remained. The mother of the patients was found to have no evidence of jaundice, splenomegaly, or anemia.

In case 2, the fecal urobilinogen was not diminished on the 10th day after splenectomy. Both the preoperative and postoperative determinations were measured on small samples of feces, and, therefore, the daily excretion could not be determined. Whether excessive pigment excretion was the result of gastrointestinal stasis or of continuing hemolysis is difficult to appraise. With the history of sluggish bowel movements in case 2 and with the marked postoperative diminution in the reticulocyte count, it is suspected that intestinal stasis, as well as the use of unavoidably small samples for analysis led to these results.

SUMMARY

Two cases of congenital hemolytic anemia in Negro brothers are presented, with data illustrating the beneficial effects of splenectomy. This report makes a total of 20 patients in 10 families now recorded in the literature. Six of the 20 patients are males.

6524 W. Franklin St.

MEDICAL EDUCATION in the UNITED STATES and CANADA

FIFTY-THIRD ANNUAL REPORT ON MEDICAL EDUCATION IN THE UNITED STATES AND CANADA BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

Francis R. Manlove, M.D., Donald G. Anderson, M.D., and Anne Tipner

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Introduction

This 53rd annual report on medical education in the United States and Canada, compiled by the Council on Medical Education and Hospitals, covers the period from July 1, 1952, to June 30, 1953. Included in it are data, derived from official sources, concerning medical schools, students, graduates, the relationship of medical education to national defense, and other topics of importance. This annual compilation is an important reference source for many individuals and organizations that are concerned with medical education. The Council is grateful to the many persons who have contributed to the development of the report and wishes particularly to thank the administrative officers of the medical schools who, at the expense of much time and effort, have provided most of the basic information upon which the report is based.

Publication of the final report of the Survey of Medical Education [1] was an event of major importance this year. Data published annually in this report have reflected financial, organizational, and other problems of the medical schools and have reported the planning and experimentation of the schools to meet these problems. All of those concerned with medical education will therefore welcome an opportunity to review their own problems and plans in light of the careful analyses and recommendations, covering all phases of our medical schools' activities, which are contained in the survey report.

The financial support of medical education continues as a problem of immediate and pressing importance. As is noted in the section on financial support, significant increases in the annual income of the schools has been offset to a considerable degree by expansion in the activities of the schools and by inflationary increases in costs. Although tremendous expenditures have been made by the schools in recent years for the construction of new facilities, a considerable proportion of these expenditures have been for clinical facilities and many schools are still particularly in need of funds for the improvement of their basic science facilities. All schools have not participated equally in the increased support that has been made available, and several have had so little success as to place their continued existence in doubt. However, there are new medical schools in the process of development that seem assured of substantial and continuing support.

Among the many curriculum experiments that have been initiated by the schools, the one that will attract the greatest interest is that being carried on at Western Reserve University. This program is organized completely along the lines of correlative, multi-disciplined teaching and discards the traditional division of teaching by special basic science and clinical disciplines. The first class to receive instruction under this plan was enrolled in 1952-1953. A brief description of the program is contained in the section on major developments, and a panel discussion of it, by members of the Western Reserve faculty, will be found in the Proceedings of the Annual Congress on Medical Education and Licensure for 1953.

Another event that will attract attention is the leveling off in student enrollment. Both last year's freshman class and the expected freshman class for 1953-1954 are slightly smaller than the entering class of 1951-1952. This may be regarded as a temporary readjustment following a period of rapid expansion, and further increases in enrollments are expected when expansion programs now under construction are completed and when new schools now being planned are in full operation.

Certainly more important than this temporary levelling off in the expansion of enrollments of undergraduate medical students is the absence of any increase in the number of graduate students in the basic medical sciences. Continuing failure to increase the supply of scientists in these already undermanned areas will have a serious effect not only upon research programs but upon the quality of the basic educational programs in medicine.

1. Deitrick, J. E., and Berson, R. C.: Medical Schools in the United States at Mid-Century, New York, McGraw-Hill Book Co., 1953.

This year, for the first time, information is presented on the scholarship and loan funds available to undergraduate students of medicine. These data make it clear that while some schools have relatively large sums for such purposes, a number of other schools can offer little such help to their students.

At this writing, it is too early to tell what the full impact of the Korean truce on the medical schools will be. At least, for a short term, military calls for medical officers may decrease somewhat and the drain on medical faculties may be eased. Nevertheless, a significant degree of mobilization is certain to continue and the need for preparation of medical students for military and civil defense services will persist. Long range plans for medical education for national defense have been under development by the Joint Committee on Medical Education in Time of National Emergency since June of 1950. The section on Medical Education and National Defense reports the initiation, by the Subcommittee on Medical Education for National Defense, of a new experimental program to prepare undergraduate students for their roles in military service and civil defense.

Survey of Medical Education

Previous Educational Numbers have carried brief progress reports of the Survey of Medical Education, which was organized in 1947 under the joint sponsorship of the Council on Medical Education and Hospitals and the Association of American Medical Colleges. It was financed by the American Medical Association, the Association of American Medical Colleges, and a grant from the W. K. Kellogg Foundation. During the past year the final report of the survey was completed and published in book form.[1] The report is based on the findings of detailed visits by the staff of the survey to 41 medical schools, on additional information provided in response to questionnaires by all the medical schools, and on data compiled over the years by the Council on Medical Education and Hospitals and the Association of American Medical Colleges.

Rather than concentrate its attention primarily on the teaching programs of the medical schools, the survey, as explained by its chairman, Alan Valentine [2] in his foreword to the report, early became convinced that its most important contribution lay in the direction of analyzing and defining the current position of the medical schools as social and educational instruments. Thus, a considerable proportion of the report deals with an analysis of the activities of a medical school, the finances of the medical schools and the administrative organization, policies, and practices of the schools.

The report presents the most convincing evidence yet compiled demonstrating the complexity and broad scope of the activities and responsibilities of a modern medical school. It analyzes in detail the activities of typical schools in the three major fields of education, research, and service. This analysis is significant in the light that it sheds on the nature and reasons for the high cost of maintaining a modern medical school. Actually, the report estimates that despite recent substantial increases in the budgets of the medical schools, the schools in terms of purchasing power of the dollar are spending only slightly more on instruction now than they were just before World War II. An analysis of the schools' expenditures indicates that during the decade 1940-1950, primary emphasis was on expansion of research activities. Noting this and other shifts of emphasis, the report urges that the medical schools define precisely the activities that are to be included in medical education, that the schools revise their accounting practices in accord with such a definition, and that the schools maintain a balance in their activities that will preserve their basic function as educational institutions.

These recommendations point up the growing realization among many medical educators that the solution of the financial problem of the medical schools lies as much in reappraising the uses to which available funds are being put as it does in securing additional funds even though there is no question that the total programs of many schools require more adequate support.

It may be commented here that it is doubtful if better cost accounting alone will solve any major problems of inadequate support. Even though it may be shown, as it is in the report of the survey, that university funds assigned to a medical school are used to support the teaching of large numbers of students in other departments, the demonstration of this fact does not increase the total amount of money available to a university for its total educational program. On the other hand, such improved accounting should give the university additional arguments to support its efforts to secure more funds for its medical school and should help to relieve the medical school of possible embarrassment resulting from the fact that its costs are usually high relative to those of other departments of a university.

The report of the survey, however, does suggest certain approaches that should result in more actual money being made available to the medical schools for their essential activities. Thus the report strongly urges that medical schools seek more adequate reimbursement of the indirect costs of research when they accept research grants from government agencies or other sources. The report also urges that the hospital costs of indigent patients be borne by the appropriate private and governmental agencies and not by the medical schools from funds that were given for educational purposes. Again, on the side of conserving the resources and energies of the medical schools, the report warns the schools against the dangers inherent in undertaking extensive medical service programs beyond the needs of the schools' instructional programs.

The report reviews in some detail the various relationships that exist between medical schools and their teaching hospitals and points out that medical schools control appointments to the staff in less than half of their teaching hospitals. The difficulties created for the medical schools by this lack of control in the selection of those who do much important teaching are thoroughly examined. The report makes the further disturbing ob-

1. Deitrick, J. E., and Berson, R. C.: Medical Schools in the United States at Mid-Century, New York, McGraw-Hill Book Co., 1953.

2. The other members of the Survey of Medical Education were Drs. Herman G. Weiskotten, Victor Johnson, and Donald G. Anderson, representing the Council on Medical Education and Hospitals, and Drs. Arthur C. Bachmeyer, Joseph C. Hinsey, and Dean F. Smiley representing the Association of American Medical Colleges. Dr. John E. Deitrick served as director and Dr. Robert C. Berson as associate director of the survey.

servation that in certain large city and county hospitals, the unsatisfactory position of the medical schools has not improved essentially since Abraham Flexner's critical comments on these same relationships in 1910. The report urges that until the hospitals referred to fulfill the requirements for a teaching hospital, the medical schools should refuse to conduct teaching programs in them. Unfortunately, many of the schools involved in such unsatisfactory relationships have no other hospitals to which they can readily turn.

The report contains an excellent chapter on the subject of the selection and admission of students to medical school. Emphasizing that the future quality of medical education, research, and service will depend primarily upon the quality of students selected by the medical schools, the report points out that while the schools have expended a great deal of effort in the selection of students, there are a number of ways in which many schools could improve the quality of their work in this area. In general, these schools would benefit by clarifying their policies and criteria for selection, by making more effective use of the information that is available concerning applicants, and by organizing their admissions committees more effectively and giving more adequate financial support to these committees. The report, while decrying discriminatory and restrictive admission practices and policies, makes a strong plea to state authorities and civic groups that they recognize that the intelligent discharge of the admissions function is hampered and not aided by laws and regulations that seek to limit the nature and extent of the personal information that may be made available to a medical school concerning its applicants.

The section of the report dealing with the administrative and departmental organization of the medical schools again calls attention to the complexity of the activities of a modern medical school. It points out the need for fresh thinking in the design of both the over-all administration of the school and the organization of the individual departments of the school.

The chapter of the report dealing with the curriculum is perhaps most noticeable for the critical light it turns on the philosophy and practices of many schools with respect to examinations. The report calls attention to and cites examples of the emphasis many schools place on multiple examinations that tend to dissipate the time and energies of the medical student and to discourage him from developing a mature attitude toward his medical education. This chapter also points to the great dissatisfaction with teaching in outpatient departments that prevails among both students and teachers in the majority of medical schools and analyzes the underlying reasons for this dissatisfaction.

Although many will feel that the portion of the chapter on curriculum dealing with preceptorships and home care programs is overly critical, the weaknesses and abuses of these programs that are reported are real and their recognition and correction are essential if these programs are to have a valid place in medical education.

The final chapter of the report, appropriately entitled "A Summing Up," brings into final sharp focus the more important questions raised in the body of the report: What is medical education? What is a medical school and what are its responsibilities? Should research be the major goal of a medical school and receive the greatest financial support? What is the goal of the medical school in providing medical care?

The report, while not attempting to answer these and other questions with finality makes pointed observations on all of them. It comments that too often a school today is judged by the public by the magnitude of its activities rather than by the quality of its educational program. It discusses the problems created as medical schools have expanded into medical centers and the trend among medical educators to build large empires with increasing influence and control over many areas of health care.

The chapter concludes with a reminder of the essential truth that it is the medical student who should be at the focus of all the medical school's activities and policies and asks what are the effects of the present programs of the schools on the medical student of today. In a brief and vivid answer, it depicts the present program of medical education as encouraging the development of physicians accustomed to living in a protective, institutional environment, whose capacities for independence and leadership remain undeveloped. To guard against this, the report makes a plea for teachers and administrators who have courage and faith in the idea that the quality of medical education will determine the future of medicine in the United States.

Following the main report are six appendices presenting tables and supporting data. Of particular significance and interest is the appendix summarizing student opinions concerning medical education that were elicited at each school visited by the survey. These expressions of student opinion are for the most part mature, well-considered criticisms that merit the careful consideration of all concerned with medical education.

The report is directed not only to medical educators but equally to the general public in the hope that it will provide the public with a better understanding of the modern medical school and its problems. To meet the needs of this group of readers, the report has brought together a great deal of basic information and statistical data concerning the medical schools and their many activities.

Purposely, no schools are singled out by name for praise or censure in the report. Some who read the report many be surprised at the extent to which it is critical of the medical schools; others may feel that it is not sufficiently critical. Little space has been taken in the report to call attention to or praise those features of the schools which deserve commendation. The survey was not designed to glorify the medical schools, and it has not done so.

Some may be disappointed that the survey does not blueprint a new philosophy or new program of medical education. Although such an approach might have been an interesting and stimulating one, the survey felt that its most useful approach would be to provide a glass into which each school could peer and ask itself which of the faults and failings of American medical education there mirrored are cast by its image. To a large degree the report of the survey has been successful in achieving this end, and the self-examination it is certain to stimulate in each school should lead to a very definite improvement

in medical education in this country in the years immediately ahead.

As previously reported, a separate subcommittee was appointed by the survey to make a special study of preprofessional education as it relates to medicine. The report of this study which was supported by a grant from the John and Mary Markle Foundation, is now in press, and its publication later this fall is being eagerly awaited.[3]

First World Conference on Medical Education

This report is being written on the eve of the First World Conference on Medical Education to be held in London, Aug. 22-29, 1953, under the auspices of the World Medical Association. The holding of this conference bespeaks the growing recognition that medical education is of basic importance in all efforts to improve medical care and to advance medical knowledge. It also reflects the increasing extent to which thinking in medical education, as in medical science, is transcending national boundaries, with men from all parts of the world seeking to share experiences and knowledge with their colleagues in other countries.

Four fundamental subjects have been selected for discussion by representatives of medical schools from more than 40 countries. These subjects are (1) requirements for entry into medical schools; (2) aims and content of the medical curriculum; (3) techniques and methods of medical education, and (4) preventive and social medicine.

It is expected that the numerous representatives from the United States will not only contribute actively to the program of the Conference but will also benefit from the exchange of information, views, and philosophies concerning medical education as it is conducted in many other parts of the world. Arrangements have been made to have the proceedings of the conference published by the Oxford University Press.

Major Developments in the Medical Schools

Information of general interest concerning any major new developments during 1952-1953 was requested from the schools again this year. These data are reported under the headings of curricular changes, organization and administration, hospital affiliations, construction, and miscellaneous.

Revision, modification, or experimentation with the curriculum were reported by 16 schools. Medical educators will be especially interested in the radically new approach to undergraduate medical education that has been developed at Western Reserve University. Planning for this new program was begun in 1945 and the experiment has been subsidized by a grant totaling $728,000 given by the Commonwealth Fund. The objective is to provide a basic education that will prepare the student to become a family physician, specialist, teacher, or investigator. The unique features of the program are the methods by which correlated instruction is to be given in the biology of man, the principles of medicine, and care of the patient. Teaching is carried out by interdepartmental teaching committees in three phases, under the direction of a coordinator for each phase. The traditional departmental organization of teaching has therefore been abandoned and this policy is carried through to the laboratory phases of instruction. Instead of the usual departmental laboratories, each student is provided with his own laboratory where, throughout the year, he carries out all of his laboratory work.

Students are regarded as maturing individuals and as graduate students who are to be given increasing responsibility for their own education and free time in each year for the pursuit of elective studies.

The first class was enrolled in this program last fall, and this class will be graduated in 1956. While the first phase has been organized and activated, the second and third phases are not yet completely planned.

Phase 1, the first year, involves study of the normal biology of man, with a multi-disciplined approach to the study of organs and organ function rather than the usual study by separate disciplines. The biochemical activities of the body are stressed. In this phase students are also introduced to the normal infant, adult and family, and to the behavior of man as a member of society.

Phase 2, the second and third years, will emphasize the principles of medicine, prevention of disease, mechanisms of disease, and the natural history of disease. The approach will be from the standpoint of diseases of organs and systems instead of by the older division of teaching by separate special disciplines. A progressively increasing amount of clinical work will be introduced, with major emphasis on diagnosis and on the definition of the principles involved in the mechanisms of illness and of treatment.

Phase 3 will involve application of the material covered in the first two phases to the care of patients in the hospital and at home.

Space prohibits the presentation here of more than a bare outline of the background, the objectives, and the mechanics of this unique program. Those interested in a more detailed report are referred to a panel discussion by members of the medical faculty at Western Reserve, which is reported in the Proceedings of the Annual Congress on Medical Education and Licensure for 1953.

Other schools that reported curriculum changes or plans for such changes were Arkansas, Southern California, Indiana, Kansas, Louisville, Maryland, Harvard, Albany, New York Medical College, Cornell, Pennsylvania, Jefferson, Temple, South Carolina, and Southwestern. The general trends which have characterized postwar curriculum changes continued. Several schools reported programs designed to achieve integration of teaching of basic science subjects without regard for the traditional departmental lines. There were further reductions in the hours devoted to didactic teaching in the clinical years and substitution of increases in clinical clerkship assignments and in the time given to correlated clinical teaching. Several schools announced programs emphasizing comprehensive study of the patient through the development of general medical clinics, reduction in assignments to special clinics, and various types of family and home care plans. The new experimental course in comprehensive medicine at Cornell University is now in effect for all four classes.

3. Severinghaus, A. E.; Carman, H. J., and Cadbury, W. E., Jr.: Preparation for Medical Education in the Liberal Arts College, New York, McGraw-Hill Book Co., to be published.

Administrative or organizational changes were reported by several schools. Louisville established new research laboratories for the department of biochemistry, a research laboratory for the department of surgery, and a department of physical medicine and rehabilitation. At Syracuse, full-time departments of preventive medicine and psychiatry have been organized and partially staffed, and a full-time professor and head for the department of pediatrics has been appointed. Albany has also appointed a full-time head for pediatrics. At Oregon the medical faculty has assumed responsibility for operation of the state crippled children's program. Temple University reported appointment of additional full-time teachers in clinical departments and the establishment of a new research laboratory for the department of physiology. The University of Washington has developed a hospital extension service in connection with the chronic disease unit at King County Hospital and the senior clerkship program. This is an experimental program designed to test the effectiveness, for certain selected, chronically ill patients, of home care as compared with hospital care. This school has also inaugurated surgical and obstetrical clerkships utilizing private patients in several affiliated hospitals.

Important changes in their hospital relationships were reported by several schools. Boston University has a new affiliation with the Boston City Hospital that permits the medical school to appoint a director of pediatric teaching for the hospital and permits the dean, professor of pediatrics, and director of pediatric teaching to nominate all appointments to the pediatric staff. This school has developed an affiliation, under a dean's committee, for graduate training in surgery and medicine, at the Providence Veterans Administration Hospital. The affiliation for obstetrical teaching in the Malden Hospital has been discontinued. The gynecological and obstetrical service at the Boston City Hospital has been reorganized and a new affiliation developed that will allow the deans of the three Boston medical schools to nominate the person to be appointed to the newly created full-time position of director of the gynecological and obstetric service. This makes possible the development of a cooperative teaching program in which all three schools will participate. Indiana this year assumed additional teaching and service obligations at the LaRue D. Carter Psychiatric Hospital, located on the medical center campus, and has also assumed responsibility in connection with the Cold Spring Road Veterans Administration Hospital for Tuberculosis. The University of Louisville has assumed professional responsibility for a geriatric hospital recently established by the city. North Carolina opened its new teaching hospital last year, and Mississippi began construction of a university hospital in December. Albany has consummated a new agreement with the Albany General Hospital under the terms of which the hospital has agreed to underwrite the major share of the clinical budget of the medical college.

Capital expenditures of the medical schools have been reported for the past three years. Beginning with 1951-1952, the schools were asked to report separately the amounts spent for projects completed and amounts spent for projects initiated. In this report, as in last year's, an effort has been made to exclude figures and projects that were reported in previous years.

Projects costing a total of $8,206,082 were completed during the past year. New clinical facilities or additional clinical facilities were completed at Kansas, Michigan, and Wisconsin. Additional laboratory space was constructed or old quarters were remodeled at Western Reserve and Tennessee. Student dormitories and an alumni building were constructed at Meharry.

For new projects initiated during the past year, the schools spent a total of $34,394,005. New medical school buildings or additions to existing buildings were reported by Indiana, Louisiana State, Harvard, Missouri, Minnesota, Brooklyn, New York University, North Carolina, Western Reserve, Oregon, Tennessee, and Southwestern. New clinical facilities or the expansion or renovation of existing facilities were started at Alabama, George Washington, Missouri, Washington University, Nebraska, Rochester, and Oregon. Yale and Cornell began the construction of student residences, and Kansas began a continuation center and student union.

The total of $42,600,087 spent for projects initiated or completed during 1952-1953 brings the gross total of such expenditures, during the past four years, to more than $284,000,000. Totals of $81,640,735 were reported for 1951-1952, $60,000,000 for 1950-1951, and more than $100,000,000 for 1949-1950. The sharp decrease in expenditures during the past year follows the completion, by many schools, of extensive programs of rehabilitation and expansion. Although such expenditures in the years immediately ahead can scarcely be expected to match the unprecedented expenditures of the years immediately following the end of World War II, the data for capital programs initiated last year indicate that substantial new construction will continue for several years at least.

However, it is important to keep in mind that a high proportion of the expenditures that have been reported have been for hospitals and dispensaries that, in addition to their essential role in medical education, have another important role to play in providing medical service to the public. A considerable share of these expenditures could therefore legitimately be charged to medical service rather than to medical education. Furthermore, the fact that many schools have been fortunate enough in recent years to acquire splendid new facilities should not obscure the fact that the needs of many schools have been only partially met. There remain a number of schools that are struggling under the handicap of seriously inadequate facilities for basic science teaching and shortages of facilities for research in the basic and the clinical sciences.

Several additional developments were important. Stanford University has received gifts, for the medical school, totaling $1,218,000 and North Carolina has received a grant of $160,000 from the Commonwealth Fund for support of a general outpatient clinic for two and a half years. The facilities of the Medical Center of the Medical College of Alabama have been surveyed by the Infantile Paralysis Foundation, Inc., and the foundation will supply funds for the hospitalization of certain patients with poliomyelitis.

Financial Support of Medical Schools

For the seventh successive year the medical schools report a major increase in the funds available to them for their operations. For the academic year 1953-1954, the budgets of the medical and basic science schools in the United States total approximately $87,409,000. This sum represents an increase of $6,524,000 in the past year and an increase of $13,059,000 in the past two years. During the seven year period that these figures have been compiled, the budgets of the medical schools have been increased by more than $39,524,000.

The total of $87,409,000 does not include research grants and special teaching grants from outside agencies or any significant portion of the cost of operating the teaching hospitals owned by or affiliated with the medical schools. It does include a total of approximately $3,475,000 that the medical schools will spend for certain activities in their teaching hospitals. This sum, which is approximately the same as in the previous year, is largely made up of salaries of professional and technical personnel on hospital staffs, the cost of operating special laboratories, and in a few instances contributions to the operating budgets of hospitals and dispensaries used by the medical schools for teaching purposes.

As in previous years, no attempt has been made to compute the direct and frequently very substantial contributions that a number of teaching hospitals make to the educational programs of their affiliated medical schools or to estimate the value of the services contributed by the large number of unpaid members of the teaching staffs of the medical schools. Where a charge for general university administration has been made against a medical school, this charge has been subtracted. Also not included are the cost of operating the medical library and the cost of plant maintenance in two schools and a variety of items, which total slightly more than $1,400,000, for minor structural alterations, postgraduate education, special institutes, and other activities not included in the regular medical school budgets. The costs of new major construction has also been eliminated from the above total. As already noted in the section on major developments in the medical schools, the schools during the past year were engaged in constructing new facilities of various types costing about $42,600,087.

The schools estimate that receipts from tuition and other fees during the coming year will total $18,041,000, or 20.6%, of their budget. Last year tuition fees provided $17,400,000 or 21.5% of the schools' budgets. The number of schools unable to match student fees dollar for dollar with funds from nonstudent sources in their basic budgets increased from six to seven. In at least two of these schools the situation is not so unfavorable as the figures would suggest, since in each instance hospital funds that do not appear in the medical school budget provide support for comparatively large full time clinical faculties.

The median budget of the four year medical schools for the coming year will be $1,040,000. Thirty-seven schools as compared to 33 last year and 30 the year before report budgets of over a million dollars for the coming year. Eleven of these schools will have budgets of over 2 million dollars. Last year six schools were in this category. Only six of the four year schools as compared with 11 last year report budgets of less than $500,000. Of these, two have budgets of less than $400,000.

In addition to the funds discussed in the foregoing paragraphs, the schools have estimated that during the academic year 1953-1954 they will receive from outside agencies a total of $38,200,000 in grants for research and $5,300,000 in grants for special teaching activities. Funds received in these categories last year totaled $40,100,000 and $5,534,000. Past experience has shown that the total amount received in grants usually exceeds substantially the amount that the schools estimate in advance, so that the foregoing figures should not be interpreted as indicating that the schools face a reduction in the amount of money they will receive in the form of research and teaching grants during the coming academic year.

In 1952-1953 all schools received funds in both of these categories. Among the four year schools the range in grants for research varied from $13,000 to $4,150,000. Twelve schools received more than one million dollars in grants for research and 14 other schools received between $500,000 and a million dollars. Last year the schools in these categories numbered 12 and 10 respectively.

TABLE 1.—*Recapitulation of Estimated Funds Available to Medical Schools, 1953-1954*

Funds for Construction and Operation of Major Clinical Facilities Not Included

Budgeted funds and appropriations	$ 87,409,000
Funds for miscellaneous projects	1,400,000
Research grants from outside agencies	38,200,000
Teaching grants from outside agencies	5,300,000
	$132,309,000

Table 1 recapitulates the funds that the medical schools will expend during the coming academic year in support of their activities exclusive of new construction and the operation of major clinical facilities. As emphasized in previous reports, it is important that it be understood that the total of $132,309,000 shown in the table will support many activities in addition to the instruction of undergraduate medical students. As is clearly demonstrated in the report of the Survey of Medical Education, a modern medical school conducts a broad program of instruction, research, and service. Tables 12 and 14 indicate the extent to which the medical schools are providing directly for the educational needs of large numbers of other students in addition to undergraduate medical students. Almost one-third of the total sum that will be expended by the medical schools next year is definitely earmarked for research and a smaller portion for the support of clinical services. Additional direct and indirect support of research and clinical services will undoubtedly be provided by the basic budgets of many medical schools, although the actual amount cannot be estimated.

Despite the steady increase in funds that have been made available to the medical schools in the past seven years, medical educators, pointing to the continuing inflation and the continuing demands that are being placed on the medical schools for more research, more service, and the expansion of their student bodies, have indicated that many schools are still operating under serious finan-

cial pressures. Faculty salaries by and large have not kept pace with the rising cost of living, and many schools have expressed real concern over their ability to hold their present faculties and even more concern over their ability to recruit able young teachers.

It is difficult at this time to estimate accurately the total current needs of the medical schools for additional operating funds. An intensive study of this problem has just been initiated by the Council on Medical Education and Hospitals and the Association of American Medical Colleges. The results of this study should be available late this year or early in 1954.

The last comprehensive study of this problem was made by the Surgeon General's Committee on Medical School Grants and Finances, which reported that, on the basis of figures compiled for the year 1947-1948, the schools needed an additional 40 million dollars. Since that time the sum of the funds available to the medical schools annually has increased by approximately $51,500,000. However, when consideration is given to the increase in costs and the expansion of the schools' activities in the interval, it is clear that this increase is not all net gain. Seven schools continue to operate on total budgets of less than $500,000. The persistent difficulty several of these schools are encountering in their efforts to secure more adequate support raises a question as to whether the universities or groups sponsoring these particular schools are in a position to continue to assume the responsibilities involved in the conduct of a modern medical school.

The National Fund for Medical Education and the American Medical Education Foundation

The last two Educational Numbers have included brief reports of the activities of the National Fund for Medical Education and the American Medical Education Foundation, two closely associated organizations engaged in raising unrestricted funds annually on a national basis to assist the medical schools in securing more adequate financial support.

In July, 1953, these organizations in their fourth series of grants distributed a total of $1,944,151.64 to the schools for use during the coming academic year. This latest sum increases to over $4,750,000 the total assistance provided the medical schools by these two organizations since the first grants were made in July, 1951. Both organizations are intensifying their activities, with the strong hope that through their combined efforts they will shortly be able to provide the medical schools with at least 10 million dollars annually to aid in meeting the operational costs of their educational programs.

Medical Education and National Defense

Since the onset of war in Korea, the Joint Committee on Medical Education in Time of National Emergency, representing the Council on Medical Education and Hospitals and the Association of American Medical Colleges, has collaborated closely with the Department of Defense, the Armed Forces, the Selective Service System, the Public Health Service, the Civil Defense Administration, and other governmental agencies in dealing with problems created for medical education by the defense needs of the country. This coordination of effort has been of material assistance in the development of programs and policies designed to cope with these problems. As a result, the needs of the armed forces for medical personnel have been met and at the same time the medical schools have been able to fulfill their other obligations to the nation by supplying an increasing flow of well-trained physicians.

The joint committee early recognized the need for long range plans to meet the medical requirements of the military and of civil defense and suggested that the medical curriculum be revised to give proper emphasis to subjects of importance to military medicine and other fields vital to national defense. The joint committee therefore appointed in November, 1950, a subcommittee on curriculum under the chairmanship of Dr. Stanley W. Olson to recommend appropriate changes in the medical curriculum. This committee, in consultation with representatives of the armed forces and the Public Health Service prepared and submitted to the joint committee an outline of the subject material of importance to military medicine and civil defense.[4] They recommended that this material be covered in already established courses rather than by new courses inserted in already crowded curriculums.

During the past year the Subcommittee on Medical Education for National Defense, in collaboration with representatives of the Department of Defense, the Public Health Service, and the Civil Defense Administration, has developed experimental programs designed to emphasize the aspects of medicine necessary to national defense and to interpret in constructive fashion, for the undergraduate medical student, his responsibilities for military service and his role in civil defense. Five medical schools were selected for the initial experiment: Buffalo, Cornell, Illinois, Vanderbilt, and California. Financing for the programs was provided by a grant of $75,000 obtained through the armed forces and the Armed Forces Medical Policy Council. Each of the institutions involved in the experiment appointed a coordinator who was instructed to use his own judgment in selecting what seemed to be the best means of implementing the new program in his own school.

In the past, instruction in military medicine was given at the undergraduate level largely through R. O. T. C. and reserve officer courses, which unduly emphasized military organization and administration. The present programs are based on the premise that instruction in military organization is better learned in the military setting; the medical school can make its best contribution to defense by thoroughly indoctrinating the student in fundamental principles of medicine, with appropriate emphasis on the application of those principles to military and civil disaster situations. In this way, education for defense should not interfere with the basic education of undergraduate students and can actually serve to enhance it.

The governmental agencies have made invaluable contributions to the success of these programs not only by financial support and by the participation of their representatives in planning conferences but also by sponsoring

4. Suggestions for Supplementing the Medical Curriculum in Time of National Emergency, Report of the Joint Committee on Medical Education in Time of National Emergency, February, 1951.

special conferences for faculty members and by supplying information, films, and other teaching materials.

The methods used by the five schools varied considerably. At California, Illinois, and Vanderbilt, the major emphasis was on instruction given to the first year class; at Buffalo and Cornell programs were instituted simultaneously for all four classes. At California the material was given as a separate course, Cornell and Vanderbilt incorporated the subject matter into existing courses, while Buffalo and Illinois combined the two approaches. Each school has prepared and submitted to the subcommittee a report of its first year's experience.

Reception of the new programs by both students and faculty has been excellent. Faculty interest has been significantly stimulated as a result of participation of faculty members in a series of special conferences, sponsored by the National Research Council, the Armed Forces Institute of Pathology and the Army Medical Service Graduate School, on problems of special importance in military medicine. The subjects for the six conferences were shock, forensic pathology, stress, biological warfare, leptospiral diseases, and problems of blood transfusion in the severely wounded. These conferences served to emphasize that information drawn from military medicine is valuable to those engaged in dealing with the problems of civilian defense and civilian disaster.

Since the experiments of this first year have been considered by the subcommittee, and by the government representatives concerned, to be signally successful, and because of the continuing demands of national defense programs, the subcommittee has recommended that, as rapidly as possible, opportunity to participate in the program be offered, on a voluntary basis, to other schools. The experience of the past year indicates that each participating school will need a grant of about $15,000 for the employment of a coordinator and to defray other expenses incurred in the program. At this date, it is not yet known whether such grants will be made available by the Department of Defense to other schools wishing to participate in the program.

SELECTIVE SERVICE SYSTEM

Responsibility for the primary classification of registrants rests with the Selective Service local boards. If a person or his employer (college, medical school, or hospital) has requested his deferment and he has been classified as available for military service, then the person or his employer may, within 10 days of the mailing of the classification notice, file an appeal. Should the state appeal board sustain the classification, the registrant or his employer may, if there is a dissenting vote in the appeal board, file a written request with the local board to have the decision appealed to the National Selective Service Appeal Board. If there is no dissenting vote, the state or national director of selective service may appeal the case to the President.

The College Student Certificate (SSS Form 109) has been prescribed for the use of institutions of higher learning including those of medicine, in furnishing to the local boards information regarding registrants who are enrolled as students in those institutions. These forms should be submitted to the local boards by the educational institution on request of the registrant. However, the mere filing of such a form does not constitute a request for occupational deferment since, in order to establish the right of appeal as an interested party, a written request from the college or employer for occupational deferment must accompany the form. The registrant has the right of appeal if exercised in the prescribed 10 days. He can make his appeal informally in writing.

Eligibility for Consideration for Deferment.—The law states that the President may provide for the deferment of any person whose deferment is equitable and in the national interest. He is also informed that it is the sense of the Congress that provision should be made for the annual deferment from training and service of premedical, predental, and allied preprofessional students in numbers equal to those at present in attendance at colleges and universities. This is being provided in the general student deferment program. The President is also directed to establish a National Advisory Committee to advise the Selective Service System and aid state and local advisory boards in selecting the needed medical, dental, and allied personnel.

The conditions under which students pursuing programs of higher education may be considered for deferment are specified in sections 1622.15 and 1622.25 of the Selective Service regulations. Within the specified requirements, students of the healing arts are to be considered for deferment in the same manner as students pursuing other undergraduate or graduate courses at colleges, universities, etc.

Any student not previously deferred who is pursuing a full time course of study is entitled to a single period of statutory deferment (Class I-S) until the end of the academic year. Such deferment does not preclude the possibility of his later deferment in Class II-S. Students whose activity in study, research, medical, or other endeavors is found necessary to maintenance of the national health, safety, or interest may be deferred in Class II-S until completion of their training, provided they maintain satisfactory scholastic records. A student who is deferred for study extends his liability for military training and service up to his 35th birthday instead of his 26th, as prescribed for registrants who have never enjoyed a deferment.

In selecting a student for deferment in Class II-S the Selective Service local boards may, at their discretion, be guided either by the score made by the student on the Selective Service College Qualification Test or by his record of academic performance.

The College Qualification Test is given for the Selective Service System by the Educational Testing Service of Princeton, New Jersey. At present, in order to be eligible for deferment on the basis of this test, an undergraduate student must make a score of 70 or more. SSS Form 108 has been prescribed for furnishing to the local board the score made on the test. This score is confidential and may be divulged by the local board only to the registrant or one holding his written consent.

To qualify for deferment on the basis of academic performance, the nonprofessional student must have maintained the following standing among the male members of his class: freshman year, upper one-half;

sophomore year, upper two-thirds; junior year, upper three-fourths.

By Selective Service Regulations a student accepted in medical school on or before July 1, 1951, and who is satisfactorily pursuing full time courses of study may be deferred without consideration of class standing or the Selective Service qualification test if the college certifies him as a full time student satisfactorily pursuing his courses.

A student accepted for admission to medical school after July 1, 1951, for the class next commencing may be deferred provided that during his last full time year at a college or university he was ranked among the upper one-half of the male members of his class or had a score of 70 or more on the Selective Service College Qualification Test. A student admitted to a graduate school before July 1, 1951, who is pursuing a full time course of study may be deferred provided he is meeting degree requirements. A student accepted for admission by a graduate school after July 1, 1951, as a full time student for the class next commencing may be deferred provided in his last full time academic year in a college or university he achieves a scholastic standing among the upper one-half of the male members of his class or scored 75 or more on the qualification test, and provided the graduate school certifies that he is meeting the degree requirements.

Decisions concerning deferment of American students enrolled in foreign universities, including medical students, are the responsibility of the local boards. The local board may accept or reject any claims or evidence presented for deferment.

Interns and Residents.—The Selective Service System has always recommended the deferment of graduates of medicine to complete one year of internship training. No statement of policy has been issued by the national headquarters of the Selective Service System with respect to residents or second year interns.

The National Advisory Committee to the Selective Service System has indicated that all physicians in priorities 1 and 2 will be needed by the armed forces and has advised that they apply for commissions about the time of completion of their internships. A few persons in these categories may be recommended for deferment by the Selective Service Local Boards for teaching, research, or public health service or because they are rendering essential service in isolated communities and cannot be replaced.

In addition, the only persons in this group who can justifiably be recommended for deferment are those who are accepted for training in the scarcity specialties and whose services are required to meet essential needs of medical and dental schools or hospital services. The specialties in which critical shortages exist are anesthesiology, physical medicine and rehabilitation, psychiatry, radiology, neurology, pathology, public health, orthopedic surgery, oral surgery, and the basic medical sciences. Those few persons in these groups for whom deferment is necessary may be deferred in class 2-A by the Selective Service local board. The recommendation of the advisory groups in all such cases is desirable.

Faculty Members.—A majority of the faculty members of medical schools are under age 50 and, therefore, are required to register with the Selective Service System as required under Public Law 779. No policy has been announced by Selective Service on the granting of deferment to faculty members. However, the National Advisory Committee has recommended that, as a general policy, essential members of medical, dental, and veterinary medical faculties be held in their teaching positions rather than be released for military service. This recommendation applies especially to men in the basic science departments and includes persons in priorities 1 and 2. This policy is not a blanket recommendation for deferment from military service for all teachers. Part time teachers who devote only a small part of their time to teaching, and certain of the younger full time teachers in priorities 1 and 2 will be expected to enter the military services.

THE DOCTOR DRAFT LAW OF 1953

Public Law 84, 83rd Congress, approved by the President June 29, 1953, amended the Universal Military Training and Service Act. It, and the previous amendment, Public Law 779, 81st Congress, are known as "The Doctor Draft Law."

The effective date of the whole Universal Military Training and Service Act, as now amended, is extended to July 1, 1955. No change was made in the age limit prescribed in the previous amendments which required that all physicians, dentists and allied specialists, under the age of 50, must register with their Selective Service local boards, when required to do so by proclamation of the President. These special registrants remain liable for induction up to the age of 51. Therefore, all new medical graduates under the age of 50 must register with their Selective Service local boards as physicians, regardless of any previous registration, within five days of the receipt of the degree of Doctor of Medicine. When the degree is not granted until the completion of an internship, this special registration is accordingly deferred.

As under previous provisions of the act, registrants will be arranged in four priorities signifying the order of induction. However, the criteria for such an arrangement under these priorities have been modified. The major changes enacted by the new amendment are those which provide for greater recognition of prior military service. A registrant will now receive credit for all service performed either as an officer, or as an enlisted man, since Sept. 16, 1940, regardless of whether it was before or after participation in an AST or V-12 program, or deferment by the Selective Service System for professional education prior to March 31, 1947. Also recognition is given for military service performed in the armed forces of a country allied with the United States prior to Sept. 2, 1945, while so allied.

Whereas formerly physicians who were educated in part, or in whole, at government expense, or were deferred by the Selective Service System while completing their professional education, needed 21 months of service to qualify for arrangement in priority 4, they now need only 17 months. As the result of this change, a number of physicians formerly in priorities 1 and 2 will be rearranged in priority 4. The periods of service for men called to active duty or inducted under the new law were

TABLE 2.—*Approved Medical Schools in the United States*

	Name and Location of School	1954 Premedical Requirement by Years	Students by Classes, 1952-1953						Graduates July 1, 1952 to June 30, 1953	Executive Officer	
			Freshman	Sophomore	Junior	Senior	Required Intern Year	Totals**			
	ALABAMA										
1	Medical College of Alabama, Birmingham	3	80	78	59	54	..	271	54	James J. Durrett, M.D., Dean	1
	ARKANSAS										
2	University of Arkansas School of Medicine, Little Rock	3	99	83	73	78	..	324	78	Hayden C. Nicholson, M.D., Dean	2
	CALIFORNIA										
3	College of Medical Evangelists, Loma Linda-Los Angeles	3	96	95	93	93	98	377	191 †	Walter E. Macpherson, M.D., Pres., Los Angeles; Harold Shryock, M.D., Dean, Loma Linda	3
4	University of Southern California School of Medicine, Los Angeles	3	68	65	70	72	67	275	67	Gordon E. Goodhart, M.D., Dean	4
5	Stanford University School of Medicine, Stanford-San Francisco	3	62	61	58	62	62	243	62	Windsor Cooper Cutting, M.D., Acting Dean	5
6	University of California School of Medicine, San Francisco	3	77	76	76	72	..	301	72	Francis Scott Smyth, M.D., Dean	6
	COLORADO										
7	University of Colorado School of Medicine, Denver	3	80	77	82	74	..	313	73	Francis R. Manlove, M.D., Director of the Medical Center; Robert C. Lewis, Ph.D., Dean, School of Medicine	7
	CONNECTICUT										
8	Yale University School of Medicine, New Haven	3	79	81	65	65	..	290	64	Vernon Lippard, M.D., Dean	8
	DISTRICT OF COLUMBIA										
9	Georgetown University School of Medicine, Washington	Degree*	124	111	110	96	..	441	95	Francis M. Forster, M.D., Dean; Rev. Thomas J. O'Donnell, S.J., Regent and Dean of Students	9
10	George Washington University School of Medicine, Washington	3	95	83	77	92	..	347	92	Walter A. Bloedorn, M.D., Dean	10
11	Howard University College of Medicine, Washington	4	79	72	71	67	..	289	67	Joseph L. Johnson, M.D., Dean	11
	GEORGIA										
12	Emory University School of Medicine, Atlanta	3	72	70	71	73	..	286	73	Richard Hugh Wood, M.D., Dean	12
13	Medical College of Georgia, Augusta	3	80	79	74	81	..	314	81	Edgar R. Pund, M.D., President	13
	ILLINOIS										
14	Chicago Medical School	4	75	67	69	69	65	280	63	John J. Sheinin, M.D., President; F. J. Mullin, Ph.D., Dean of Faculty	14
15	Northwestern University Medical School, Chicago	3	130	126	137	129	..	522	130	Richard H. Young, M.D., Dean	15
16	Stritch School of Medicine of Loyola University, Chicago	3	88	82	84	80	..	334	80	John F. Sheehan, M.D., Dean	16
17	University of Chicago, The School of Medicine	3	72	71	72	66	..	281	67	Lowell T. Coggeshall, M.D., Dean, Division of Biological Sciences; Joseph J. Celthaml, Ph.D., Dean of Students	17
18	University of Illinois College of Medicine, Chicago	3	168	166	170	174	..	678	174	Roger A. Harvey, M.D., Acting Dean	18
	INDIANA										
19	Indiana University School of Medicine, Bloomington-Indianapolis	3	151	142	136	139	..	568	134	John D. Van Nuys, M.D., Dean, Indianapolis	19
	IOWA										
20	State University of Iowa College of Medicine, Iowa City	3	121	111	116	105	..	453	103	Norman B. Nelson, M.D., Dean	20
	KANSAS										
21	University of Kansas School of Medicine, Lawrence-Kansas City	3	120	117	110	103	..	450	103	W. Clark Wescoe, M.D., Dean	21
	KENTUCKY										
22	University of Louisville School of Medicine, Louisville	3	101	91	93	100	..	385	100	J. Murray Kinsman, M.D., Dean	22
	LOUISIANA										
23	Louisiana State University School of Medicine, New Orleans	3	124	120	108	105	..	457	105	William W. Frye, M.D., Dean	23
24	Tulane University of Louisiana School of Medicine, New Orleans	3	133	125	128	128	..	514	128	M. E. Lapham, M.D., Dean	24
	MARYLAND										
25	Johns Hopkins University School of Medicine, Baltimore	Degree	75	66	77	76	..	294	76	Philip Bard, Ph.D., Dean	25
26	University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore	3	104	101	98	92	..	395	92	H. Boyd Wylie, M.D., Dean	26
	MASSACHUSETTS										
27	Boston University School of Medicine, Boston	3	73	69	65	71	..	278	72	James M. Faulkner, M.D., Dean	27
28	Harvard Medical School, Boston	2	118	114	149	148	..	529	148	George Packer Berry, M.D., Dean	28
29	Tufts College Medical School, Boston	; (Degree)	115	116	109	98	..	438	100	Joseph M. Hayman Jr., M.D., Dean	29
	MICHIGAN										
30	University of Michigan Medical School, Ann Arbor	3	203	188	153	139	..	683	137	A. C. Furstenberg, M.D., Dean	30
31	Wayne University College of Medicine, Detroit	3	70	74	65	59	..	268	59	Gordon H. Scott, Ph.D., Dean	31
	MINNESOTA										
32	University of Minnesota Medical School, Minneapolis	3	129	122	134	114	115	499	232 †	Harold S. Diehl, M.D., Dean of Medical Sciences	32

	MISSOURI										
33	St. Louis University School of Medicine, St. Louis	3	128	121	131	119	..	499	116	James W. Colbert Jr., M.D., Dean	33
34	Washington University School of Medicine, St. Louis	3	86	84	99	95	..	364	95	Robert A. Moore, M.D., Dean	34
	NEBRASKA										
35	Creighton University School of Medicine, Omaha	3	76	73	72	77	..	298	76	F. G. Gillick, M.D., Dean	35
36	University of Nebraska College of Medicine, Omaha	3	87	76	95	86	..	344	87	James P. Tollman, M.D., Dean	36
	NEW YORK										
37	Albany Medical College, Albany	3	52	55	58	50	..	215	47	Harold C. Wiggers, Ph.D., Dean	37
38	University of Buffalo School of Medicine, Buffalo	4	72	72	70	60	..	274	59	Stockton Kimball, M.D., Dean	38
39	Columbia University College of Physicians and Surgeons, New York	3	1 0	114	113	116	..	463	116	Willard C. Rappleye, M.D., Dean	39
40	Cornell University Medical College, New York	3 and Degree	86	83	85	81	..	338	84	Dayton J. Edward, Ph.D., Acting Dean	40
41	New York Medical College, Flower and Fifth Avenue Hospitals, New York	Degree	129	130	113	121	..	493	121	J. A. W. Hetrick, M.D., President, Ralph E. Snyder, M.D., Executive Dean	41
42	New York University College of Medicine, New York	3	143	134	124	128	..	529	127	Currier McEwen, M.D., Dean	42
43	State University of New York College of Medicine at New York City	3	151	146	139	140	..	590	140	Jean A. Curran, M.D., Dean	43
44	University of Rochester School of Medicine and Dentistry	3	71	72	67	65	..	275	64	Donald G. Anderson, M.D., Dean	44
45	State University of New York at Syracuse College of Medicine	3	77	72	68	61	..	278	61	William R. Willard, M.D., Dean	45
	NORTH CAROLINA										
46	Duke University School of Medicine, Durham	3	78	79	78	80	..	315	85	Wilburt C. Davison, M.D., Dean	46
47	Bowman Gray School of Medicine of Wake Forest College, Winston-Salem	3	53	50	51	52	..	206	52	C. C. Carpenter, M.D., Dean	47
	OHIO										
48	University of Cincinnati College of Medicine, Cincinnati	3	90	85	90	89	..	354	89	Stanley E. Dorst, M.D , Dean	48
49	Western Reserve University School of Medicine, Cleveland	3	78	83	85	78	..	324	78	Joseph T. Wearn, M.D., Dean	49
50	Ohio State University College of Medicine, Columbus	3	150	141	141	84	..	516	84	Charles A. Doan, M.D., Dean	50
	OKLAHOMA										
51	University of Oklahoma School of Medicine, Oklahoma City	3	100	101	82	78	..	361	78	Mark R. Everett, Ph.D., Dean	51
	OREGON										
52	University of Oregon Medical School, Portland	3	78	74	55	67	..	274	71	D. W. E. Baird, M.D., Dean	52
	PENNSYLVANIA										
53	Hahnemann Medical College and Hospital of Philadelphia	3	105	98	98	84	..	385	83	Charles L. Brown, M.D., Dean	53
54	Jefferson Medical College of Philadelphia	3	170	167	164	161	..	662	160	George Allen Bennett, M.D., Dean	54
55	Temple University School of Medicine, Philadelphia	3	133	122	131	122	..	508	122	William N. Parkinson, M.D., Vice President and Dean	55
56	University of Pennsylvania School of Medicine, Philadelphia	3	127	127	128	129	..	511	129	John McK. Mitchell, M.D., Dean	56
57	Woman's Medical College of Pennsylvania, Philadelphia	4	50	45	42	46	..	183	46	Marion Fay, Ph.D., Dean	57
58	University of Pittsburgh School of Medicine, Pittsburgh	3	100	91	98	100	..	389	99	William S. McElroy, M.D., Dean	58
	SOUTH CAROLINA										
59	Medical College of South Carolina, Charleston	3	79	69	55	57	..	260	57	Kenneth Lynch, M.D., President; John T. Cuttino, M.D., Dean	59
	TENNESSEE										
60	University of Tennessee College of Medicine, Memphis	3	216	182	159	156	..	713	155	O. W. Hyman, Ph.D., Vice President and Dean	60
61	Meharry Medical College, Nashville	3	65	65	68	61	..	259	69	Harold D. West, Ph.D., President; Daniel T. Rolfe, M.D., Dean	61
62	Vanderbilt University School of Medicine, Nashville	3 and Degree	53	47	55	51	..	206	51	John B. Youmans, M.D., Dean	62
	TEXAS										
63	Southwestern Medical School of The University of Texas, Dallas	3	101	97	103	98	..	399	98	George Aagaard, M.D., Dean	63
64	University of Texas School of Medicine, Galveston	3	165	157	136	137	..	595	138	Chauncey D. Leake, Ph.D., Director; D. Bailey Calvin, Ph.D., Dean of Students and Curricular Affairs	64
65	Baylor University College of Medicine, Houston	3	95	95	87	88	..	365	88	Stanley Olson, M.D., Dean	65
	UTAH										
66	University of Utah School of Medicine, Salt Lake City	3	54	52	47	28	..	181	28	John Z. Bowers, M.D., Dean	66
	VERMONT										
67	University of Vermont College of Medicine, Burlington	3	51	48	43	42	..	184	42	George A. Wolf, M.D., Dean	67
	VIRGINIA										
68	University of Virginia Department of Medicine, Charlottesville	3	76	67	72	71	..	286	70	Thomas H. Hunter, M.D., Dean	68
69	Medical College of Virginia, Richmond	3	84	80	103	99	..	366	100	John B. Truslow, M.D., Dean	69
	WASHINGTON										
70	University of Washington School of Medicine, Seattle	3	76	69	69	72	..	284	72	James W. Haviland, M.D., Acting Dean	70 *
	WISCONSIN										
71	University of Wisconsin Medical School, Madison	3	83	81	82	76	..	322	76	William S. Middleton, M.D., Dean	71
72	Marquette University School of Medicine, Milwaukee	3	100	98	99	93	..	390	92	John S. Hirschboeck, M.D., Dean	72
	Totals		7,140	6,795	6,725	6,475	407	27,135	6,668		

* Ninety semester hours for veterans.
** Intern enrolment not included in total column.
† Figures represent two classes. Intern year requirement discontinued.

also revised. Those with 9 months or less of service must serve 24 months. Those with 9 to 12 months will serve 21 months. Those with 12 to 15 months service will serve 18 months, and those with 15 to 21 months service will serve 15 months. Those physicians in priority 4 who have had 21 months or more of service since Sept. 16, 1940, are no longer liable for induction or recall to duty, except in time of war or national emergency declared by Congress.

"Active service" and "active duty" are defined as: full time duty since Sept. 16, 1940 in the service of the United States Army, Navy, Marine Corps, Coast Guard, or Public Health Service, including reserve components; time spent during World War II, by conscientious objectors, in work of national importance; service performed before Sept. 2, 1945 in armed forces of countries which were allies of the United States during World War II; service performed as a physician or dentist employed by the Panama Canal Health Department between Sept. 16, 1940, and Sept. 2, 1945.

Specifically excluded from consideration as "active service" is time spent in V-12 or AST programs, in military internships, residencies or senior student programs, time spent in military service for the sole purpose of

TABLE 3.—*Approved Medical Schools in Canada*

	Name and Location of School	1954 Pre-medical Requirement by Years	Students by Classes—1952-1953: First Pre-medical Year	Second Pre-medical Year	Freshman	Sophomore	Junior	Senior	Additional Year	Required Intern Year*	Totals	Graduates, July 1, 1952 to June 30, 1953	Executive Officer	
	ALBERTA													
1	University of Alberta Faculty of Medicine, Edmonton	3	...	...	60	52	66	53	..	..	231	52	John W. Scott, M.D., Dean	1
	MANITOBA													
2	University of Manitoba Faculty of Medicine, Winnipeg	3	...	...	73	61	78	61	..	69	273	72	Lennox G. Bell, M.D., Dean	2
	NOVA SCOTIA													
3	Dalhousie University Faculty of Medicine, Halifax	2	...	...	59	53	50	54	..	56	216	56	H. G. Grant, M.D., Dean	3
	ONTARIO													
4	Queen's University Faculty of Medicine, Kingston	2†	63	...	61	64	59	57	57	..	361	57	G. Harold Ettinger, M.D., Dean	4
5	University of Ottawa Faculty of Medicine, Ottawa	2†	43	...	63	52	47	46	..	48	251	52	A. L. Richard, M.D., Dean	5
6	University of Western Ontario Faculty of Medicine, London	3	...	...	60	58	60	60	..	..	238	62	J. B. Collip, M.D., Dean	6
7	University of Toronto Faculty of Medicine, Toronto	2†	127	120	156	149	161	170	..	..	883	162	J. A. MacFarlane, M.B., Dean	7
	QUEBEC													
8	McGill University Faculty of Medicine, Montreal	3	...	...	108	106	111	117	..	..	442	115	C. Lyman Duff, M.D., Dean	8
9	University of Montreal Faculty of Medicine, Montreal	4	...	...	121	98	98	97	..	93	414	89	Wilbrod Bonin, M.D., Dean	9
10	Laval University Faculty of Medicine, Quebec	4	119	...	125	87	135	137	..	110	603	108	Charles Vézina, M.D., Dean	10
	Totals		352	120	886	780	865	852	57	376	3,912	825		

* Intern enrollment not included in total column.
† Grade XIII Honor Matriculation.

TABLE 4.—*Approved Schools of the Basic Medical Sciences in the United States and Canada*

	Name and Location of School	1954 Pre-medical Requirement by Years	Students by Classes, 1952-1953: Freshman		Sophomore		Total	Executive Officer	
	UNITED STATES								
	MISSISSIPPI								
1	University of Mississippi School of Medicine, University	3	27 28	55	27 27	54	109	David S. Pankratz, M.D., Dean	1
	MISSOURI								
2	University of Missouri School of Medicine, Columbia	3	44		39		83	Roscoe L. Pullen, M.D., Dean	2
	NEW HAMPSHIRE								
3	Dartmouth Medical School, Hanover	3 and Degree	24		24		48	Rolf C. Syvertsen, M.D., Dean	3
	NORTH CAROLINA								
4	University of North Carolina School of Medicine, Chapel Hill *	3	60		58		118	W. Reece Berryhill, M.D., Dean	4
	NORTH DAKOTA								
5	University of North Dakota School of Medicine, Grand Forks	3	40		32		72	Theo. H. Harwood, M.D., Dean	5
	SOUTH DAKOTA								
6	University of South Dakota School of Medical Sciences, Vermillion	3	30		33		63	W. L. Hard, Ph.D., Dean	6
	WEST VIRGINIA								
7	West Virginia University School of Medicine, Morgantown	3	32		28		60	Edward J. Van Liere, M.D., Dean	7
	Totals		285		268		553		
	CANADA								
	SASKATCHEWAN								
8	University of Saskatchewan School of Medical Sciences, Saskatoon	2	32		29		61	J. Wendell Macleod, M.D., Dean	8
	Totals	..	32		29		61		
	Grand Totals	..	317		297		614		

* Expanded to four year medical school. Enrollment for third year class in 1952-1953 was 48.

undergoing physical examination, and training entered into after June 29, 1953.

The law continues to permit the deferment of those persons whose activities are essential to the national health, safety, or interest.

It is the duty of the National Advisory Committee and the voluntary state and local committees of the Selective Service System to make recommendations to the Selective Service System concerning the essentiality or availability of special registrants who are being classified by their local boards. This duty includes recommendations concerning residents, faculty members, and those engaged in essential laboratory and clinical research.

Korean "G. I. Bill"

A detailed analysis of the Korean "G. I. Bill" (Public Law 550, 2nd Session, 82nd Congress) was presented in last year's Educational Number. It may be expected that an increasing number of veterans will utilize the benefits provided by this law to obtain their premedical or medical education. Likewise, many physician veterans on their release from service will undoubtedly take additional graduate education under the provisions of the law. The Veterans Administration has ruled that both internships and residencies will be classified as institutional type training for the purpose of this law. This ruling corrects the unsatisfactory situation existing under the original "G. I. Bill," whereby internships and general practice residencies were treated as on-the-job training and residencies in the specialties were classified as institutional programs.

Approved Medical Schools

The 72 medical schools in the United States that are approved by the Council on Medical Education and Hospitals are listed in table 2; the 10 approved Canadian schools are named in table 3. The 8 approved schools of the basic medical sciences in the United States and Canada are listed in table 4. There has been no change in the lists since the publication of the 1952 Educational Number.

These tables give the number of years of premedical training that each school will require of freshmen entering in 1954. They also list the number of students enrolled in each class for the academic year 1952-1953, the number of students enrolled in internships that are a part of the degree requirement, and the number of students graduated by each school from July 1, 1952, to June 30, 1953. For the Canadian schools enrollments are given for premedical students, students enrolled in a fifth medical year, and those in a required intern year.

The name of the dean or executive officer appears opposite the name of each school. Changes in the chief executive officers have been made by 17 of the 90 medical and basic science schools of the United States and Canada since publication of the 1952 Educational Number. New executive officers have been appointed by Stanford, Georgetown, Georgia, Illinois, Iowa, Johns Hopkins, Tufts, St. Louis, Albany, Cornell, Rochester, Baylor, Virginia, Washington, Missouri, North Dakota, and Southern California.

Medical School Calendars

Conventional schedules were followed during the 1952-1953 academic year by most schools, with students entering in September or October and graduating in May or June. Schedules for the freshman class will be the same in all schools for 1953 as for 1952.

At Kansas, where the freshman year consists of two semesters and a summer session, with vacations and periods of instruction staggered, half the freshmen began their studies in June and half in September. Graduation is in June. The University of Tennessee admitted students each quarter and graduated a class each quarter.

At Duke University, the academic year consists of three quarters each year. There is no summer quarter between the first and second year, but in the two clinical years the subjects of the autumn, winter, and spring terms are repeated in the summer quarter. This accelerated schedule is optional, and students may take their first year and three quarters in each of their subsequent years and receive their certificates in four calendar years; if they receive permission from the curriculum committee, they may at the end of their second year take the clinical quarters given during the summer and receive their certificates in three and one-quarter calendar years. Freshmen are admitted in September only.

Freshmen students are admitted to the University of Chicago annually in September. They may, however, elect to accelerate their programs and graduate in a minimum of approximately three and one-quarter years.

The University of Utah, which had been on an accelerated program, returned to a conventional schedule for the class entering in September, 1951. During the transition the upper classes will complete their medical course on an accelerated schedule. Mississippi continued to admit a class in July and one in January. Canadian medical schools followed regular schedules during the past year and will continue to do so in the coming year.

Scheduled Clock Hours of Instruction

The schools were requested to estimate the approximate total of hours scheduled for each class enrolled during the 1953-1954 academic year. The 73 schools reporting on the first two years had an average of 1,152 hours scheduled for the first year and 1,156 hours for the second year. For the first year, the lowest number of scheduled hours reported was 804 and the highest was 1,521; for the second year the low was 864 hours and the high was 1,548 hours. Sixty-six schools reported an average of 1,318 hours in the third year, with a low of 751 and a high of 2,119. Sixty-five schools that gave figures for the fourth year had an average of 1,421 hours, with a low of 944 and a high of 2,376.

Comments that accompanied many of these estimates of scheduled hours make it clear that the figures from different schools, as furnished, are not comparable and do not always reflect accurately the total hours of instruction that are given. Some schools did not include as regularly scheduled hours time devoted to elective courses and other schools excluded night duty that constitutes a regular part of clinical clerkship assignments. An additional variable is introduced by the difference in the length of the academic year, which may range from two semesters to four quarters in length.

Enrollments

For the fifth consecutive year the total number of students enrolled in approved medical schools in the United States established a new record. Enrollment in the 72 medical and 7 basic science schools during 1952-1953 totalled 27,688 as compared to 27,076 in the previous year. There was an increase in total enrollment of 612, or 2.3%. There was, however, for the first time in five years, a slight decrease in the size of the entering freshman class. This class, numbering 7,425, was smaller by 16, or 0.2% than last year's entering class. This leveling off in the size of the freshman class, following four consecutive entering classes of record size, is expected to be temporary. New facilities now in operation and expansion programs soon to be completed should provide further significant expansion of enrollments.

When students now enrolled in the medical schools of the University of California at Los Angeles, the University of Miami, the University of North Carolina and the University of Puerto Rico are included, the total enrollment is increased by 279. However, these schools are not in full operation and consequently not yet eligible for Council approval. Their enrollment figures, therefore, may not be added to the present official totals.

Enrollment figures for each approved school are given in tables 2 and 4 and total enrollments for all approved medical schools and basic science schools in the United States and Canada are summarized in table 5.

In addition to students regularly enrolled as full time students of medicine, the schools had enrolled a total of 140 part time and special students working toward the M.D. degree.

Total enrollment in the 10 medical schools and one basic science school in Canada was 3,444, a decrease of 14, or 0.4%, since last year. These schools had 472 additional students enrolled in two premedical years and 57 in an additional (not intern) year. These additional students are included in the "total" column of table 3 and are not included in table 5.

There were 783 students in the United States and Canada who were enrolled in internships that were a part of the degree requirement of the medical schools at which they were educated. The total number of students enrolled in such internships in the United States for each academic year since 1930-1931 is shown in table 6.

TABLE 5.—*Enrollments by Classes in Medical Schools of the United States and Canada, 1952-1953*

Students in the required intern year are not included.

	No. of Schools	Freshmen	Sophomores	Juniors	Seniors	Total	Total Preceding Session
United States							
Medical Schools	72	7,140	6,795	6,725	6,475	27,135	26,715
Basic Science Schools	7	285	268	.....	.....	553	561
Totals	79	7,425	7,063	6,725	6,475	27,688	27,076
Canada							
Medical Schools	10	886	780	865	852	3,383*	3,391†
Basic Science School	1	32	29	.....	.....	61	64
Totals	11	918	809	865	852	3,444*	3,458†
Totals	90	8,343	7,872	7,590	7,327	31,132	30,534

* Does not include 472 premedical and 57 fifth year students.
† Does not include 395 premedical and 194 fifth year students.

Total enrollments, by classes, in the medical and basic science schools of the United States, for each academic year since 1930-1931 are shown in table 7. For years prior to 1942-1943, the totals given in table 7 are somewhat higher than the sum of the figures for the various classes in a given year. This discrepancy was due to the inability of certain schools, in those earlier years, to classify their students strictly into conventional classes.

TABLE 6.—*Students in the Required Intern Year in the United States, 1931-1953*

1930-1931	1,025	1942-1943	639
1931-1932	1,067	1943-1944	451
1932-1933	1,106	1944 (Second Session)	447
1933-1934	1,183	1944-1945	452
1934-1935	1,233	1945-1946	488
1935-1936	1,213	1946-1947 *	582
1936-1937	1,255	1947-1948	447
1937-1938	1,132	1948-1949	458
1938-1939	1,152	1949-1950	454
1939-1940	1,152	1950-1951	501
1940-1941	1,058	1951-1952	379
1941-1942	767	1952-1953	407

* Includes additional classes.

In table 8, the medical schools of the United States are ranked according to the size of their student bodies. Enrollments ranged from 181 to 713 with a median of 447 and an average of 377.

In addition to regularly enrolled medical students, there were 140 part time or special students working toward the M.D. degree in medical schools in the United States and two such students in Canadian schools. The distribution of these students, by schools, is recorded in the first column of table 14.

TABLE 7.—*Students in the Medical and Basic Science Schools in the United States, 1931-1953*

Students in the required intern year are not included.

	Freshman	Sophomore	Junior	Senior	Total
1930-1931	6,456	5,538	5,080	4,908	21,982
1931-1932	6,260	5,462	4,932	4,885	22,135
1932-1933	6,426	5,479	5,017	4,948	22,466
1933-1934	6,457	5,571	4,988	4,937	22,799
1934-1935	5,356	5,642	5,142	4,905	22,888
1935-1936	6,005	5,458	5,230	5,020	22,564
1936-1937	5,910	5,269	5,140	5,158	22,095
1937-1938	5,791	5,225	4,986	5,036	21,587
1938-1939	5,764	5,160	4,947	4,921	21,302
1939-1940	5,794	5,177	4,921	4,894	21,271
1940-1941	5,837	5,254	4,969	4,849	21,379
1941-1942	6,218	5,406	5,087	4,942	22,031
1942-1943	6,425	5,828	5,278	5,100	22,631
1943-1944	6,561	6,071	5,640	5,257	23,529
1944 (second session)	6,648	6,140	6,684	5,794	24,666
1944-1945	6,523	5,979	5,700	5,826	24,028
1945-1946	6,060	5,750	5,751	5,655	23,216
1946-1947 *	6,564	5,575	5,767	5,994	23,900
1947-1948	6,487	5,758	5,154	5,340	22,739
1948-1949	6,688	6,194	5,702	5,086	23,670
1949-1950	7,042	6,344	6,079	5,638	25,103
1950-1951	7,177	6,690	6,263	6,056	26,186
1951-1952	7,436	6,864	6,577	6,195	27,076
1952-1953	7,425	7,063	6,725	6,475	27,688

* Includes additional classes.

Graduates

The 6,668 students graduated during the past year constitute the largest group ever graduated in one academic year from medical schools in the United States. This total exceeds by 279, or 4.4%, the previous record established in 1947, when at the termination of the wartime accelerated program several schools graduated more than one class. Tables 2 and 3 show, respectively, the number of students graduated from each approved medical school in the United States and Canada.

The total number of class A and approved medical schools, together with the total numbers of their students and graduates for each year since 1910 is shown in table 9. Similar figures for class B and C schools for the years 1910-1929 are recorded in table 10. The A, B, C classification of medical schools, inaugurated by the Council in 1910, was discontinued in 1929. Since 1929 schools have been classified as "approved," which is equivalent to the former class A, or as "unapproved." This fact should be borne in mind by those who desire to make comparative studies on the production of physicians at different periods.

TABLE 8.—*Medical Schools of the United States in Order of Size of Total Enrollment, 1952-1953*

Four Year Medical Schools	
University of Tennessee	713
University of Michigan	683
University of Illinois	678
Jefferson Medical College	662
University of Texas	595
State University of New York, New York City	590
Indiana University	568
Harvard Medical School	529
New York University	529
Northwestern University	522
Ohio State University	516
Tulane University	514
University of Pennsylvania	511
Temple University	508
University of Minnesota	499
St. Louis University	499
New York Medical College	493
Columbia University	463
Louisiana State University	457
State University of Iowa	453
University of Kansas	450
Georgetown University	441
Tufts College Medical School	438
Southwestern Medical School	399
University of Maryland	395
Marquette University	390
University of Pittsburgh	389
University of Louisville	385
Hahnemann Medical College	385
College of Medical Evangelists	377
Medical College of Virginia	366
Baylor University	365
Washington University	364
University of Oklahoma	361
University of Cincinnati	354
George Washington University	347
University of Nebraska	344
Cornell University	338
Stritch School of Medicine	334
Western Reserve University	324
University of Arkansas	324
University of Wisconsin	322
Duke University	315
Medical College of Georgia	314
University of Colorado	313
University of California	301
Creighton University	298
Johns Hopkins University	294
Yale University	290
Howard University	289
University of Virginia	286
Emory University	286
University of Washington	284
University of Chicago	281
Chicago Medical School	280
State University of New York, Syracuse	278
Boston University	278
University of Southern California	275
University of Rochester	275
University of Oregon	274
University of Buffalo	274
Medical College of Alabama	271
Wayne University	268
Medical College of South Carolina	260
Meharry Medical College	259
Stanford University	243
Albany Medical College	215
Vanderbilt University	206
Bowman Gray School of Medicine	206
University of Vermont	184
Woman's Medical College	183
University of Utah	181
Schools of the Basic Medical Sciences	
University of North Carolina	118
University of Mississippi	109
University of Missouri	83
University of North Dakota	72
University of South Dakota	63
University of West Virginia	60
Dartmouth Medical School	48

The schools with the largest numbers of graduates during the past academic year were Illinois 174, Jefferson 160, Tennessee 155, Harvard 148 and the State University of New York College of Medicine at New York City 140. Four schools had less than 50 graduates, including Albany with 47, Woman's Medical College with 46, Vermont with 42, and Utah with 26. The University of Minnesota and the College of Medical Evangelists this year abolished a required intern year and, therefore, gave diplomas to two classes which numbered 232 and 191 respectively.

Increases in the size of graduating classes were reported by 46 schools for the 1952-1953 academic year, and decreases were reported by 18; 6 had the same number as the previous year.

TABLE 9.—*Schools, Students[1] and Graduates in Approved Medical Schools,[2] (Class A) in the United States, 1910-1953*

Students in the required intern year are not included.

	Schools	Students	Graduates
1910	66	12,530	3,165
1915	67	11,314	2,629
1920	70	12,559	2,680
1921	70	13,488	2,811
1922	69	14,625	2,304
1923	70	16,454	2,881
1924	70	16,775	3,343
1925	71	17,462	3,842
1926	71	17,887	3,732
1927	73	18,754	3,798
1928	74	19,794	4,091
1929	75	20,843	4,412
1930	76	21,597	4,565
1931	76	21,982	4,735
1932	76	22,135	4,936
1933	77	22,466	4,895
1934	77	22,799	5,035
1935	77	22,888	5,101
1936	77	22,564	5,183
1937	77	22,095	5,377
1938	77	21,587	5,194
1939	77	21,302	5,089
1940	77	21,271	5,097
1941	77	21,379	5,275
1942	77	22,031	5,163
1943	76	22,631	5,223
1944	77	23,529	5,134
1944 (Second Session)	77	24,666	5,169
1945	77	24,028	5,136
1946 (to May 31)	77	23,216	5,826
1947	77	23,900	6,389
1948	77	22,739	5,543
1949	78	23,670	5,094
1950	79	25,103	5,553
1951	79	26,186	6,135
1952	79	27,072	6,080
1953	79	27,688	6,668

1. Includes figures for schools of the basic medical sciences.
2. Medical schools graded as Class A from 1900-1929; as approved since 1929.

TABLE 10.—*Schools,[1] Students and Graduates in the United States, 1910-1929. Class B and Class C Medical Schools*

Students in the required intern year are not included.

	Class B			Class C		
	Schools	Students	Graduates	Schools	Students	Graduates
1910	43	6,944	854	22	2,052	421
1915	22	2,668	688	15	909	219
1920	10	731	162	8	798	205
1921	9	832	200	7	553	180
1922	7	852	143	7	663	182
1923	4	522	83	7	456	156
1924	4	583	115	6	370	104
1925	3	554	118	6	184	14
1926	3	582	130	5	371	100
1927	3	564	117	4	344	120
1928	2	371	96	4	380	75
1929	1	35	34	0	0	0

1. Includes figures for schools of the basic medical sciences.

The Canadian medical schools reported 825 graduates, 42 more than for 1951-1952. The largest numbers were graduated by Toronto with 162 and McGill with 115; the smallest classes were at Alberta and Queens with 52 each.

TABLE 11.—*Graduates with Baccalaureate Degrees in Medical Schools in the United States and Canada, July 1, 1952 to June 30, 1953*

	Graduates	Degrees	Per Cent with Degrees
United States			
Medical College of Alabama	54	50	92.6
University of Arkansas	78	42	53.8
College of Medical Evangelists	191	164	85.9
University of Southern California	67	39	58.2
Stanford University	62	62	100.0
University of California	72	72	100.0
University of Colorado	73	60	82.2
Yale University	64	59	92.2
Georgetown University	95	92	96.8
George Washington University	92	74	80.4
Howard University	67	67	100.0
Emory University	73	66	90.4
Medical College of Georgia	81	69	85.2
Chicago Medical School	63	47	74.6
Northwestern University	130	130	100.0
Stritch School of Medicine	80	30	37.5
University of Chicago	67	45	67.2
University of Illinois	174	171	98.3
Indiana University	134	130	97.0
State University of Iowa	103	81	78.6
University of Kansas	103	103	100.0
University of Louisville	100	90	90.0
Louisiana State University	105	85	81.0
Tulane University	128	113	88.3
Johns Hopkins University	76	76	100.0
University of Maryland	92	76	82.6
Boston University	72	62	86.1
Harvard Medical School	148	131	88.5
Tufts College Medical School	100	97	97.0
University of Michigan	137	109	79.6
Wayne University	59	46	78.0
University of Minnesota	232	232	100.0
St. Louis University	116	72	62.1
Washington University	95	83	87.4
Creighton University	76	76	100.0
University of Nebraska	87	76	87.4
Albany Medical College	47	45	95.7
University of Buffalo	59	43	72.9
Columbia University	116	115	99.1
Cornell University	84	78	92.9
New York Medical College	121	110	90.9
New York University	127	122	96.1
State University of New York, New York City	140	130	92.9
University of Rochester	64	60	93.7
State University of New York, Syracuse	61	53	86.9
Duke University	85	56	65.9
Bowman Gray School of Medicine	52	41	78.9
University of Cincinnati	89	78	87.6
Western Reserve University	78	72	92.3
Ohio State University	84	84	100.0
University of Oklahoma	78	64	82.1
University of Oregon	71	71	100.0
Hahnemann Medical College	83	82	98.8
Jefferson Medical College	160	147	91.9
Temple University	122	101	82.8
University of Pennsylvania	129	121	93.8
Woman's Medical College	46	44	95.7
University of Pittsburgh	99	90	90.9
Medical College of South Carolina	57	49	86.0
University of Tennessee	155	77	49.7
Meharry Medical College	60	48	80.0
Vanderbilt University	51	51	100.0
Southwestern Medical School	98	65	66.3
University of Texas	138	110	79.7
Baylor University	88	47	53.4
University of Utah	28	26	92.9
University of Vermont	42	38	90.5
University of Virginia	70	57	81.4
Medical College of Virginia	100	87	87.0
University of Washington	72	50	69.4
University of Wisconsin	76	76	100.0
Marquette University	92	60	65.2
Totals	6,668	5,725	85.8
Canada			
University of Alberta	52	51	98.1
University of Manitoba	72	23	31.9
Dalhousie University	56	18	32.1
Queen's University	57	6	10.5
University of Western Ontario	62	35	56.5
University of Toronto	162	37	22.8
McGill University	115	96	83.5
University of Montreal	89	89	100.0
Laval University	108	108	100.0
University of Ottawa	52	31	59.6
Totals	825	494	59.9

The estimated number of graduates for 1953-1954, based on enrollments reported for senior classes in schools in the United States, is 6,831; for the Canadian schools it is 867.

There was an increase in both the number and the percentage of medical graduates in the United States and Canada who had baccalaureate degrees. Table 11 shows that 5,725, or 85.8%, of all medical graduates in the United States and 494, or 59.5%, of Canadian graduates held baccalaureate degrees.

Responsibility of Medical Schools for Other Students

In recent years, increasing recognition has been given to the heavy burden of instruction that medical faculties must assume over and above their regular programs for undergraduate medical students. Medical faculties provide part or all of the instruction given to large numbers of students, other than medical students, at both the undergraduate and graduate levels. That an attempt should be made, in any study of the cost of medical education, to segregate the cost of these additional programs has been emphasized in previous issues of this report.

The extent of these extra duties is indicated by the figures reported in tables 12 and 13. In previous years, these figures were summarized in a single table. However, this year, in order to identify the groups of extra students more clearly, graduate students and physicians working toward advanced degrees have been listed in a separate table.

Table 12 shows by general categories the numbers of students for whom medical schools were responsible other than undergraduate medical students and graduate students who are candidates for advanced degrees. In the groups presented in this table were a total of 50,445 students. Medical faculties provided full courses of instruction for students in technical schools, interns, residents, and fellows in the medical specialties and in some instances dental students also. The total numbers of such students was 14,811.

Table 13 summarizes the gross total figures, collected since 1947-1948, concerning students other than medical students who have received instruction from medical schools. Since statistics for the years 1947-1948 through 1949-1950 are incomplete in some categories, the total figures for those years should not be compared with those for subsequent years. It should also be noted that the figures for graduate students have now been entirely deleted from table 12. The gross total of 50,445, from table 12, when combined with the total figures for graduate students recorded in table 14 gives a grand total of 54,149 other students who received instruction from medical faculties. This is less by 1,288 than the total reported the previous year.

There were significant increases in the number of technical students (646), nursing students (460), interns (322), and residents (335). On the other hand, there were major decreases in the numbers of physicians enrolled in refresher courses (1,428), nonmedical students taking medical courses (1,059), dental students (455), and pharmacy students (375).

The numbers of physicians and graduate students working toward advanced degrees in medical school departments are recorded in four groups in tables 14 and 15. There were 1,419 physicians working toward advanced degrees in medical school departments and 2,285 additional graduate students enrolled in programs leading to advanced degrees in the basic medical sciences. During

TABLE 12.—*Other Students for Whom Medical Schools were Responsible, 1952-1953*

School	Part Time or Special Students Working Toward M.D. Degree	Dental Students Receiving Instruction from Medical School Faculty	Pharmacy Students Receiving Instruction from Medical School Faculty	Nursing Students Receiving Instruction from Medical School Faculty	Students in Technical Schools Receiving Instruction from Medical School Faculty	Nonmedical Students Taking Medical Courses	Physicians Enrolled in Refresher or Continuation Courses	Physicians Enrolled in Formal Basic Science Courses in Preparation for Specialty Board Certification	Physicians Holding Appointments as Fellows	Interns for Whose Instruction and Supervision the Medical School Was Primarily Responsible	Residents for Whose Instruction and Supervision the Medical School Was Primarily Responsible	Totals
UNITED STATES												
Medical College of Alabama	7	92	0	85	36	0	14	11	0	21	56	323
University of Arkansas	2	0	40	0	19	0	154	0	0	11	31	257
College of Medical Evangelists	0	0	0	176	52	1	116	8	1	98	38	490
Stanford University	0	0	0	102	57	136	141	0	33	53	72	594
University of California	0	198	75	291	39	0	617	0	0	50	105	1,375
University of Southern California	0	0	0	0	0	0	220	110	3	135	135	603
University of Colorado	1	0	0	193	33	0	1,312	5	3	48	147	1,742
Yale University	0	0	0	242	0	17	70	3	28	44	65	469
George Washington University	0	0	0	0	12	563	178	0	36	22	39	850
Georgetown University	0	188	0	116	2	0	24	0	8	11	48	397
Howard University	0	156	75	35	0	54	0	0	1	0	0	321
Emory University	0	150	0	367	25	0	127	0	19	53	126	867
Medical College of Georgia	9	0	0	32	1	4	44	0	0	14	41	145
Chicago Medical School	0	0	0	0	0	0	0	0	0	0	0	0
Northwestern University	3	0	0	175	80	0	12	0	0	135	143	498
Stritch School of Medicine	11	0	0	0	0	0	0	0	0	0	0	11
University of Chicago	0	0	0	0	0	0	0	0	0	30	100	130
University of Illinois	0	229	266	66	0	22	17	0	0	25	91	716
Indiana University	1	142	0	228	48	12	392	19	5	19	100	966
State University of Iowa	0	101	47	220	43	442	5	57	4	16	121	1,056
University of Kansas	12	0	41	165	0	583	1,600	2	3	19	75	2,500
University of Louisville	0	176	0	82	11	11	450	0	3	20	55	808
Louisiana State University	3	0	0	128	0	0	35	20	1	0	78	265
Tulane University	1	0	0	65	0	127	70	13	39	33	82	430
Johns Hopkins University	0	0	0	228	0	9	17	0	57	0	0	311
University of Maryland	0	0	46	71	6	0	49	59	12	28	63	334
Boston University	0	0	0	62	40	37	8	0	7	0	5	159
Harvard Medical School	0	28	0	0	0	0	382	55	361	0	0	826
Tufts College Medical School	0	269	0	0	0	0	78	0	65	0	0	412
University of Michigan	1	99	26	89	69	0	493	24	8	14	46	869
Wayne University	1	70	0	0	65	0	185	0	0	66	60	447
University of Minnesota	1	330	186	161	1,292	0	1,413	0	0	30	115	3,528
University of Mississippi	4	0	44	8	0	1	0	0	0	0	0	57
St. Louis University	5	147	0	202	137	0	6	0	0	5	26	528
University of Missouri	4	0	0	21	15	372	0	0	0	0	0	412
Washington University	0	0	0	0	77	47	6	11	68	51	124	384
Creighton University	3	92	24	85	0	8	0	0	0	23	15	250
University of Nebraska	0	0	0	120	18	0	121	0	0	12	39	310
Dartmouth Medical School	1	0	0	130	20	0	0	0	1	16	48	216
Albany Medical College	0	0	0	257	0	0	49	0	19	32	51	408
University of Buffalo	0	124	65	40	0	0	143	0	2	0	0	374
Columbia University	0	80	0	322	0	100	485	44	14	0	0	1,045
Cornell University	0	0	0	79	0	0	30	18	41	0	0	168
New York Medical College	0	0	0	173	0	0	84	5	3	2	26	293
New York University	0	0	0	479	0	106	0	0	60	59	143	847
State University of New York, New York City	1	0	0	0	0	0	25	40	0	35	85	186
University of Rochester	1	0	0	253	0	0	0	0	10	53	77	394
State University of New York, Syracuse	0	0	0	0	0	0	390	0	0	9	62	461
Duke University	2	0	0	129	48	10	10	10	19	46	97	371
University of North Carolina	2	82	91	42	0	129	331	0	3	26	24	730
Bowman Gray School of Medicine	1	0	0	117	18	0	0	0	0	9	51	196
University of North Dakota	1	0	0	105	2	70	0	0	0	0	0	178
Ohio State University	0	120	0	143	127	1,147	0	0	0	14	121	1,672
University of Cincinnati	0	0	0	124	3	3	337	0	22	52	114	655
Western Reserve University	7	172	0	257	17	0	235	55	34	0	0	777
University of Oklahoma	0	0	0	160	26	0	348	58	3	24	40	659
University of Oregon	19	0	0	397	34	4	451	0	0	17	74	996
Hahnemann Medical College	0	0	0	130	20	0	0	0	7	13	43	213
Jefferson Medical College	0	0	0	0	0	0	0	26	4	33	62	125
Temple University	1	0	0	251	20	0	86	5	0	19	102	434
University of Pennsylvania	0	140	0	37	0	44	0	0	138	26	171	556
University of Pittsburgh	3	0	0	800	0	0	88	83	0	9	90	1,023
Woman's Medical College of Pennsylvania	0	0	0	57	0	0	0	0	6	3	9	75
Medical College of South Carolina	0	0	64	155	12	0	501	0	9	11	28	780
University of South Dakota	3	0	0	0	0	135	0	1	0	0	1	140
Meharry Medical College	1	130	0	26	21	0	0	0	0	1	15	194
University of Tennessee	0	203	121	142	23	0	60	0	0	0	0	549
Vanderbilt University	0	0	0	0	0	0	0	0	0	25	53	78
Baylor University	1	0	0	0	12	0	99	0	3	62	94	271
Southwestern Medical School	6	0	0	0	0	3	177	0	1	34	154	375
University of Texas	1	75	0	254	30	3	325	0	5	20	100	813
University of Utah	4	0	25	35	9	546	148	0	17	22	77	883
University of Vermont	2	0	0	40	24	1	0	0	1	20	25	113
Medical College of Virginia	0	205	235	381	44	52	625	0	4	36	84	1,666
University of Virginia	0	0	0	205	7	0	318	0	16	28	71	645
University of Washington	2	151	53	302	29	2,904	429	9	25	32	51	3,987
West Virginia University	1	0	45	0	23	6	0	0	0	0	0	75
Marquette University	5	220	0	0	0	0	200	0	0	0	0	425
University of Wisconsin	6	0	98	252	262	922	121	5	8	24	62	1,760
Totals	140	4,169	1,667	10,089	2,958	8,631	14,401	706	1,240	1,898	4,546	50,445
CANADA												
University of Alberta	0	0	0	0	0	0	165	0	0	0	0	165
University of Manitoba	0	0	0	0	0	0	55	0	0	69	9	133
Dalhousie University	0	24	38	22	0	29	296	0	0	56	0	465
Queen's University	0	0	0	166	0	112	85	4	7	84	0	458
University of Ottawa	0	0	0	12	0	2	13	0	0	48	9	84
University of Toronto	0	172	169	13	0	547	89	53	72	0	0	1,115
University of Western Ontario	2	0	0	53	0	0	0	0	14	20	0	89
Laval University	0	0	0	0	89	0	12	8	0	0	0	109
McGill University	0	70	0	0	0	0	0	0	0	0	0	70
University of Montreal	0	36	275	0	0	88	0	43	0	93	0	535
University of Saskatchewan	0	0	62	17	0	200	0	0	0	0	0	279
Totals	2	302	544	283	89	978	715	108	93	370	18	3,502

TABLE 13.—*Other Students for Whom Medical Schools in the United States Were Responsible, 1947-1953*

	Part Time or Special Students Working Toward M. D. Degrees	Dental Students Receiving Instruction from Medical School Faculty	Pharmacy Students Receiving Instruction from Medical School Faculty	Nursing Students Receiving Instruction from Medical School Faculty	Students in Technical Schools Receiving Instruction from Medical School Faculty	Nonmedical Students Taking Medical Courses	Physicians Enrolled in Refresher or Continuation Courses	Physicians Enrolled in Formal Basic Science Courses in Preparation for Specialty Board Certification	Physicians Holding Appointments as Fellows	Interns for Whose Instruction and Supervision the Medical School Was Primarily Responsible	Residents for Whose Instruction and Supervision the Medical School Was Primarily Responsible	Totals
1947-1948	105					478	13,187	2,338				16,108
1948-1949	93					2,039	15,695	1,697				19,524
1949-1950	110					2,720	17,930	1,087	1,135	1,960	4,345	29,287
1950-1951	106	3,854	2,497	9,195	1,402	9,838	17,654	1,152	1,238	1,786	4,259	52,981
1951-1952	125	4,626	2,042	9,629	1,312	9,690	15,829	978	1,204	1,576	4,211	51,222
1952-1953	140	4,169	1,667	10,089	2,958	8,631	14,401	706	1,240	1,898	4,546	50,445
Totals	679	12,649	6,206	28,913	5,672	33,396	94,696	7,958	4,817	7,220	17,361	219,567

* Figures not available.

TABLE 14.—*Physicians and Graduate Students Working for Advanced Degrees in Medical School Departments, 1952-1953*

UNITED STATES School	Physicians Working Toward Advanced Degrees	Other Graduate Students Working for Degrees in Basic Medical Sciences	Total Students Receiving Master's Degree for Work in Medical School Departments	Total Students Receiving Ph.D. Degree for Work in Medical School Departments
Medical College of Alabama	3	24	1	0
University of Arkansas	0	10	3	0
College of Medical Evangelists	4	0	4	0
Stanford University	1	7	3	4
University of California	0	26	5	21
University of Southern California	3	24	2	2
University of Colorado	214	49	28	10
Yale University	0	103	39	12
George Washington University	0	102	20	10
Georgetown University	1	17	2	4
Howard University	0	1	1	0
Emory University	0	8	0	0
Medical College of Georgia	0	0	0	0
Chicago Medical School	3	124	0	0
Northwestern University	44	0	26	16
Stritch School of Medicine	3	58	8	1
University of Chicago	3	124	33	32
University of Illinois	14	93	34	11
Indiana University	0	9	1	3
State University of Iowa	7	75	10	18
University of Kansas	10	28	5	3
University of Louisville	1	2	0	0
Louisiana State University	0	2	0	0
Tulane University	35	43	2	2
Johns Hopkins University	0	4	0	1
University of Maryland	0	26	1	5
Boston University	0	50	10	5
Harvard Medical School	0	49	0	0
Tufts College Medical School	0	21	6	2
University of Michigan	38	56	0	0
Wayne University	65	33	2	1
University of Minnesota	788	146	77	11
University of Mississippi	0	14	6	3
St. Louis University	22	41	8	12
University of Missouri	0	13	2	1
Washington University	0	13	0	4
Creighton University	15	4	9	0
University of Nebraska	0	4	3	1
Dartmouth Medical School	0	0	0	0
Albany Medical College	0	6	1	0
Columbia University	2	0	0	0
Cornell University	0	17	0	2
State University of New York, New York City	8	0	0	0
New York Medical College	0	0	9	0
New York University	0	41	2	4
State University of New York, Syracuse	0	17	1	1
University of Buffalo	0	30	0	0
University of Rochester	0	121	13	17
Duke University	0	0	0	0
University of North Carolina	0	30	1	2
Bowman Gray School of Medicine	0	6	2	0
University of North Dakota	0	14	5	0
Ohio State University	0	63	0	0
University of Cincinnati	10	9	0	2
Western Reserve University	0	6	0	4
University of Oklahoma	0	27	2	0
University of Oregon	0	13	7	1
Hahnemann Medical College	0	5	0	0
Jefferson Medical College	0	33	5	2
Temple University	102	4	25	0
University of Pennsylvania	0	91	7	9
University of Pittsburgh	0	0	2	2
Woman's Medical College of Pennsylvania	0	0	0	0
Medical College of South Carolina	0	21	3	1
University of South Dakota	1	7	5	0
Meharry Medical College	0	4	1	0
University of Tennessee	13	31	8	1
Vanderbilt University	0	14	0	0
Baylor University	1	5	2	0
Southwestern Medical School	0	1	1	0
University of Texas	0	27	4	1
University of Utah	2	52	6	3
University of Vermont	0	10	2	0
Medical College of Virginia	0	14	6	0
University of Virginia	1	0	0	0
University of Washington	5	62	8	3
West Virginia University	0	3	1	0
Marquette University	0	21	13	0
University of Wisconsin	0	77	9	8
Totals	1,419	2,285	502	258
CANADA School				
University of Alberta	0	2	2	0
University of Manitoba	5	0	2	0
Dalhousie University	10	6	3	0
Queen's University	4	6	9	1
University of Ottawa	9	5	2	1
University of Toronto	52	52	6	8
University of Western Ontario	4	34	10	4
Laval University	1	3	1	3
McGill University	162	0	11	7
University of Montreal	9	10	1	3
University of Saskatchewan	0	11	1	1
Totals	256	129	48	28

the past academic year, the Master of Science degree was awarded to 502 persons for completion of graduate work in Medical school departments and the Doctor of Philosophy degree to 258. While the number of graduate students in the basic medical sciences is only 25 less than last year, there was a decrease of 486 in the number of physicians working toward advanced degrees. As a consequence there has been a decrease of 511, or 12.1%, in the number of physicians and graduate students taking advanced work in medical school departments. In the basic medical sciences alone in the past two years the number of graduate students has shrunk by 15.7%. These figures are of the utmost importance, since a continuing decline in the ranks of potential teachers trained in the basic medical sciences will accentuate the already existing shortage of teaching and research personnel trained in these vitally important fields.

Canadian medical schools reported a gross total of 3,887 students other than medical students who received instruction from their medical schools last year. This represents a decrease of 601. The number of graduate students working toward advanced degrees in the basic medical sciences decreased from 160 to 129 while the number of physicians working toward advanced degrees increased from 106 to 256. The total number of students other than graduate students and undergraduate medical students for whom these schools were responsible was 3,502. A marked drop in the number of nursing students (980) more than offset increases in the numbers of non-medical students taking medical courses (61), technical students (53), physicians enrolled in refresher courses (51), and pharmacy students (41).

TABLE 15.—*Physicians and Graduate Students Working for Advanced Degrees in Medical School Departments, 1947-1953*

	Physicians Enrolled for Advanced Degrees	Other Graduate Students Working for Degrees in Basic Medical Sciences	Totals
1947-1948	813	1,090	1,903
1948-1949	1,133	1,765	2,898
1949-1950	1,125	2,094	3,219
1950-1951	1,561	2,720	4,281
1951-1952	1,905	2,310	4,215
1952-1953	1,419	2,285	3,704
Totals	7,956	12,264	20,220

Distribution of Students by Sex

Classification by sex of all students enrolled in medical and basic science schools in the United States and Canada for the academic year 1952-1953 is given in table 16. This table also records similar data for the graduates of each school.

The total number of women students and graduates and the proportion of women to all persons in these categories is given for each year since 1905 in table 18. Figures for the years 1905 through 1929 include statistics for class B and C schools; those for 1930 and subsequent years represent only approved schools.

TABLE 16.—*Distribution of Students and Graduates by Sex in the United States and Canada, 1952-1953*

	Students		Graduates	
United States	Men	Women	Men	Women
Medical College of Alabama	260	11	54	0
University of Arkansas	307	17	77	1
College of Medical Evangelists	358	19	181	10
Stanford University	223	20	59	3
University of California	286	15	70	2
University of Southern California	260	15	63	4
University of Colorado	287	26	68	5
Yale University	273	17	59	5
George Washington University	336	11	87	5
Georgetown University	421	20	90	5
Howard University	261	28	63	4
Emory University	281	5	71	2
Medical College of Georgia	298	16	76	5
Chicago Medical School	274	6	61	2
Northwestern University	496	26	124	6
Stritch School of Medicine	327	7	79	1
University of Chicago	259	22	61	6
University of Illinois	645	33	167	7
Indiana University	547	21	127	7
State University of Iowa	443	10	99	4
University of Kansas	437	13	100	3
University of Louisville	365	20	93	7
Louisiana State University	430	27	102	3
Tulane University	497	17	123	5
Johns Hopkins University	269	25	71	5
University of Maryland	381	14	91	1
Boston University	259	19	67	5
Harvard Medical School	494	35	141	7
Tufts College Medical School	422	16	96	4
University of Michigan	648	35	127	10
Wayne University	259	9	57	2
University of Minnesota	470	29	219	13
University of Mississippi	107	2	...	..
St. Louis University	492	7	114	2
University of Missouri	79	4	...	..
Washington University	347	17	88	7
Creighton University	293	5	75	1
University of Nebraska	327	17	80	7
Dartmouth Medical School	48	0	...	..
Albany Medical College	204	11	42	5
University of Buffalo	259	15	57	2
Columbia University	415	48	103	13
Cornell University	322	16	79	5
New York Medical College	461	32	110	11
New York University	498	31	117	10
State University of New York, New York City	558	32	136	4
University of Rochester	257	18	59	5
State University of New York, Syracuse	267	11	59	2
Duke University	302	13	82	3
University of North Carolina	117	1	...	..
Bowman Gray School of Medicine	199	7	50	2
University of North Dakota	71	1	...	..
Ohio State University	499	17	80	4
University of Cincinnati	351	3	89	0
Western Reserve University	296	28	72	6
University of Oklahoma	352	9	76	2
University of Oregon	263	11	69	2
Hahnemann Medical College	366	19	78	5
Jefferson Medical College	662	0	160	0
Temple University	474	34	111	11
University of Pennsylvania	488	23	125	4
University of Pittsburgh	375	14	94	5
Woman's Medical College of Pennsylvania	0	183	...	46
Medical College of South Carolina	254	6	57	0
University of South Dakota	62	1	...	..
Meharry Medical College	251	8	59	1
University of Tennessee	684	29	147	8
Vanderbilt University	199	7	50	1
Baylor University	343	22	82	6
Southwestern Medical School	374	25	95	3
University of Texas	568	27	133	5
University of Utah	176	5	26	2
University of Vermont	175	9	40	2
Medical College of Virginia	335	31	92	8
University of Virginia	283	3	67	3
University of Washington	270	14	69	3
West Virginia University	59	1	...	..
Marquette University	374	16	87	5
University of Wisconsin	296	26	13	3
Totals	26,225	1,463	6,305	363
Canada				
University of Alberta	213	18	47	5
University of Manitoba	257	16	68	4
Dalhousie University	204	12	54	2
Queen's University	221*	20*	51	6
University of Ottawa	200†	8†	51	1
University of Toronto	584‡	52*	154	8
University of Western Ontario	224	14	58	4
Laval University	471§	13§	106	2
McGill University	416	26	106	9
University of Montreal	378	36	84	5
University of Saskatchewan	52	9	...	..
Totals	3,220	224	779	46
Grand Totals	29,445	1,687	6,969	409

Number of Premedical Students Excluded:

	Men	Women
*	61	2
†	221	26
‡	114	5
§	41	2

Number of Fifth Year Students Excluded:

Men	Women
51	6

TABLE 17.—*Residence of Freshman Medical Students*

Marginal Number	School	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. of Columbia	Florida	Georgia	Idaho	Illinois	Indiana
		1	2	3	4	5	6	7	8	9	10	11	12	13
1	Medical College of Alabama	80	..	..	..	..	..	..	..	..	..	..	..	..
2	University of Arkansas School of Medicine	..	..	90	..	..	..	..	..	..	..	..	..	..
3	College of Medical Evangelists	..	..	1	35	2	2	..	..	2	..	1	1	1
4	University of Southern California School of Medicine	..	1	1	60	..	..	..	..	..	..	..	..	..
5	Stanford University School of Medicine	..	1	..	55	..	..	..	..	..	..	..	..	..
6	University of California School of Medicine	..	1	..	72	..	..	..	..	..	..	..	..	..
7	University of Colorado School of Medicine	..	1	..	..	65	..	..	..	..	..	..	..	..
8	Yale University School of Medicine	..	1	..	7	..	12	..	1	..	..	..	3	..
9	Georgetown University School of Medicine	..	..	..	3	..	8	..	6	1	..	..	1	..
10	George Washington University School of Medicine	1	2	1	11	..	..	..	14	7	1	3	1	1
11	Howard University College of Medicine	3	..	..	2	..	1	..	6	..	1	..	2	1
12	Emory University School of Medicine	2	..	..	..	..	..	..	1	20	37	..	1	..
13	Medical College of Georgia	..	..	..	..	..	..	..	..	..	80	..	..	..
14	Chicago Medical School	..	..	..	1	..	1	..	..	2	..	..	10	..
15	Northwestern University Medical School	2	3	..	9	3	2	..	..	2	..	2	43	9
16	Stritch School of Medicine of Loyola University	..	..	..	5	..	..	..	..	1	..	1	47	..
17	University of Chicago, The School of Medicine	..	..	..	11	1	1	..	..	..	..	..	17	1
18	University of Illinois College of Medicine	..	..	..	..	..	..	..	..	..	..	..	168	..
19	Indiana University School of Medicine	..	..	..	..	..	1	..	..	..	..	..	..	145
20	State University of Iowa College of Medicine	..	..	..	1	..	..	..	1	..	..	..	2	..
21	University of Kansas School of Medicine	..	1	..	..	..	..	..	..	..	..	..	..	..
22	University of Louisville School of Medicine	..	1	..	2	..	..	..	..	1	..	..	..	2
23	Louisiana State University School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..
24	Tulane University of Louisiana School of Medicine	9	2	2	2	1	..	..	..	17	5	1	..	1
25	Johns Hopkins University School of Medicine	3	..	..	2	..	2	2	2	1	..	..	3	1
26	University of Maryland School of Medicine	..	..	..	1	..	..	1	2	..	..	..	1	1
27	Boston University School of Medicine	..	..	..	..	..	3	..	..	..	..	..	2	..
28	Harvard Medical School	1	..	..	7	..	3	..	3	1	..	..	9	1
29	Tufts College Medical School	..	..	..	..	..	16	..	..	..	..	..	..	..
30	University of Michigan Medical School	..	..	..	..	..	..	..	..	1	1	..	2	5
31	Wayne University College of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..
32	University of Minnesota Medical School	..	..	..	..	..	..	..	..	..	..	..	..	..
33	University of Mississippi School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..
34	University of Missouri School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..
35	St. Louis University School of Medicine	1	..	..	12	3	4	..	..	1	..	1	10	2
36	Washington University School of Medicine	..	1	2	8	..	..	..	1	5	..	3	10	1
37	Creighton University School of Medicine	..	..	..	11	2	1	..	..	..	..	3	..	..
38	University of Nebraska College of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..
39	Dartmouth Medical School	..	..	1	..	..	1	..	..	..	..	..	..	..
40	Albany Medical College	..	..	..	..	..	4	1	..	..	..	..	..	..
41	University of Buffalo School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..
42	Columbia University College of Physicians and Surgeons	..	..	..	4	..	..	..	..	..	..	..	..	..
43	Cornell University Medical College	..	..	..	2	1	2	..	1	..	..	..	..	2
44	New York Medical College, Flower and Fifth Avenue Hospitals	1	2	..	2	..	1	1	1	3	..	..	3	..
45	New York University College of Medicine	1	..	..	2	..	10	..	..	1	..	..	1	..
46	State University of New York College of Medicine at New York City	..	..	..	..	..	2	..	..	..	..	..	..	..
47	University of Rochester School of Medicine and Dentistry	..	..	..	2	..	1	..	..	2	1	..	..	..
48	State University of New York at Syracuse College of Medicine	..	..	..	..	..	..	..	..	..	..	1	..	..
49	University of North Carolina School of Medicine	..	..	..	..	..	..	..	..	1	..	..	..	..
50	Duke University School of Medicine	2	1	..	1	..	..	1	1	10	2	..	..	..
51	Bowman Gray School of Medicine of Wake Forest College	..	..	..	..	..	..	..	..	8	4	..	1	..
52	University of North Dakota School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..
53	University of Cincinnati College of Medicine	..	..	..	1	1	..	..	..	..	..	..	..	2
54	Western Reserve University School of Medicine	..	..	..	..	..	..	..	..	1	..	..	3	2
55	Ohio State University College of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..
56	University of Oklahoma School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..
57	University of Oregon Medical School	..	..	..	..	..	..	..	..	..	..	4	..	..
58	Hahnemann Medical College and Hospital of Philadelphia	..	..	..	..	..	1	2	..	..	..	..	2	1
59	Jefferson Medical College of Philadelphia	..	1	..	..	..	2	2	..	1	..	1	2	1
60	Temple University School of Medicine	..	..	..	2	..	1	2	..	3	..	..	3	..
61	University of Pennsylvania School of Medicine	..	..	..	2	..	4	1	..	2	..	..	..	1
62	Woman's Medical College of Pennsylvania	..	..	..	5	..	1	..	..	2	..	..	2	..
63	University of Pittsburgh School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..
64	Medical College of South Carolina	..	..	..	..	..	..	..	..	..	..	..	..	..
65	University of South Dakota School of Medicine	..	..	..	2	..	..	..	..	..	..	..	..	..
66	University of Tennessee College of Medicine	10	1	6	..	..	1	..	..	10	3	..	..	..
67	Meharry Medical College	7	..	1	..	..	..	..	..	4	4	..	..	..
68	Vanderbilt University School of Medicine	6	1	1	..	..	..	..	1	6	2	..	1	1
69	Southwestern Medical School of The University of Texas	..	..	..	..	..	..	..	..	..	..	..	..	..
70	University of Texas School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..
71	Baylor University College of Medicine	1	1	1	..	..	..	..	..	..	..	..	..	..
72	University of Utah School of Medicine	..	2	..	..	..	1	..	..	..	..	1	..	..
73	University of Vermont College of Medicine	..	..	..	..	..	3	..	..	..	..	..	..	..
74	University of Virginia Department of Medicine	..	..	..	..	..	..	..	..	2	1	..	..	..
75	Medical College of Virginia	..	..	..	..	..	..	1	1	1	..	..	..	1
76	University of Washington School of Medicine	..	..	..	..	..	..	..	..	..	..	3	..	..
77	West Virginia University School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..
78	University of Wisconsin Medical School	..	..	..	..	..	..	..	..	..	..	..	..	..
79	Marquette University School of Medicine	..	2	..	1	..	..	..	..	..	..	..	5	1
	Totals	130	26	107	343	79	92	14	42	119	142	25	356	184
80	University of Alberta Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..
81	University of Manitoba Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..
82	Dalhousie University Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..
83	Queen's University Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..
84	University of Ottawa Faculty of Medicine	..	..	..	1	..	..	..	..	..	..	..	..	..
85	University of Western Ontario Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..
86	University of Toronto Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..
87	McGill University Faculty of Medicine	..	..	..	7	..	1	..	..	1	..	..	1	2
88	University of Montreal Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..
89	Laval University Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..
90	University of Saskatchewan School of Medical Sciences	..	..	..	..	..	..	..	..	..	..	..	..	..
	Totals	0	0	0	8	0	1	0	0	1	0	0	1	2
	Grand totals	130	26	107	351	79	93	14	42	120	142	25	357	186
		1	2	3	4	5	6	7	8	9	10	11	12	13

* Figures include two freshman classes.

† Figures are for students in beginning premedical year.

14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	
Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	U. S. Territories and Possessions	Canada	Foreign	Totals	Marginal Number
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	80	1
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	90	2
..	1	1	..	..	2	1	2	2	..	1	..	2	..	..	2	1	4	2	..	..	7	1	..	..	..	..	1	2	..	..	..	4	..	..	..	3	3	7	96	3
..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	2	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	68	4
..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	1	..	..	1	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	62	5
1	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	77	6
..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	6	..	..	80	7
..	2	1	..	2	..	7	..	..	..	..	1	..	..	3	6	..	18	1	..	2	1	..	4	1	1	..	..	..	..	..	..	2	..	1	..	2	..	..	79	8
..	..	..	..	1	2	13	1	..	..	..	1	..	..	..	20	..	46	..	..	2	..	..	11	6	..	..	..	..	..	..	..	..	1	..	..	..	..	1	124	9
..	..	..	..	1	8	2	1	..	..	1	1	..	..	..	5	1	5	1	..	4	..	..	11	..	..	..	..	1	..	5	1	..	1	..	1	1	2	95	10
..	..	..	1	..	..	1	2	1	2	..	..	..	..	..	5	..	11	2	..	2	2	..	7	1	5	..	3	2	..	..	5	..	2	..	..	..	9	79	11
..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	5	..	..	..	..	..	..	..	..	..	..	..	..	1	72	12
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	80	13
..	1	..	..	..	..	1	1	..	..	..	..	..	..	..	9	..	48	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	75	14
1	..	..	..	..	..	1	3	1	..	2	2	2	..	..	2	..	3	..	1	6	..	..	1	..	..	..	..	..	..	..	..	1	..	2	..	1	..	..	88	16
..	..	..	..	..	..	1	1	1	..	1	..	..	..	..	6	..	13	..	2	3	..	..	3	..	..	..	..	..	..	..	..	1	..	2	..	1	1	5	72	17
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	168	18
..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	1	151	19
113	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	121	20
..	107	..	..	..	..	..	..	..	..	8	..	..	..	..	2	1	5	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	120	21
..	..	86	..	..	..	..	..	..	..	..	..	..	..	..	2	1	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	101	22
..	..	..	124	..	..	..	1	..	28	5	1	..	..	..	..	..	8	..	1	2	..	..	..	..	..	..	3	16	1	..	..	..	..	..	..	..	..	2	124	23
1	1	2	18	..	..	..	1	..	28	5	1	..	..	..	5	1	5	1	..	4	..	..	11	..	..	..	..	1	..	5	1	..	1	..	1	1	2	95	10
..	..	..	1	..	..	1	2	1	2	..	..	..	..	..	5	..	11	2	..	2	2	..	7	1	5	..	3	2	..	..	5	..	2	..	..	..	9	79	11
..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	5	..	..	..	..	..	..	..	..	..	..	..	..	1	72	12
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	80	13
..	1	..	..	..	..	1	1	..	..	..	..	..	..	..	9	..	48	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	75	14
1	..	..	..	..	..	1	3	1	..	2	2	2	..	..	2	..	3	..	1	6	..	..	1	..	..	..	..	..	..	..	..	1	..	2	..	1	..	..	88	16
..	..	..	..	..	..	1	1	1	..	1	..	..	..	..	6	..	13	..	2	3	..	..	3	..	..	..	..	..	..	..	..	1	..	2	..	1	1	5	72	17
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	168	18
..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	1	151	19
113	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	121	20
..	107	..	..	..	..	..	..	..	..	8	..	..	..	..	2	1	5	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	120	21
..	..	86	..	..	..	..	..	..	..	..	..	..	..	..	2	1	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	101	22
..	..	..	124	..	..	..	1	..	28	5	1	..	..	..	..	..	8	..	1	2	..	..	..	..	..	..	3	16	1	..	..	..	..	..	..	..	..	2	124	23
1	1	2	18	..	..	..	1	..	28	5	1	..	..	..	5	1	5	1	..	4	..	..	11	..	..	..	..	1	..	5	1	..	1	..	1	1	2	95	10
..	..	..	..	..	5	2	1	2	2	..	..	..	..	..	5	..	14	1	..	2	..	1	5	2	1	..	1	2	..	..	2	..	2	..	..	..	2	133	24
..	..	..	..	..	76	..	..	..	..	..	..	..	..	..	1	..	6	..	..	1	..	..	3	..	..	..	..	3	..	1	..	5	..	..	2	..	..	75	25
..	..	..	..	2	..	32	1	..	..	..	..	..	..	1	4	..	13	..	..	..	..	..	3	5	..	..	..	1	..	..	..	..	..	..	..	..	..	6	104	26
1	..	..	..	..	..	21	1	3	..	1	..	..	..	..	6	1	23	1	1	9	1	1	3	..	..	1	1	2	1	1	1	3	1	3	..	1	..	5	73	27
..	..	1	..	6	..	73	..	..	..	..	..	..	..	5	1	..	4	..	..	2	..	..	..	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	118	28
..	..	..	..	..	..	..	176	1	..	..	..	..	..	..	1	..	1	..	..	4	..	..	4	..	..	1	..	..	..	..	..	1	..	1	..	2	..	2	115	29
..	..	..	..	..	..	..	70	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	203	30
..	..	..	..	..	..	..	..	119	..	..	2	..	..	..	..	..	1	..	1	..	..	..	..	..	..	4	1	..	..	..	..	..	..	..	..	..	..	1	70	31
..	..	..	..	..	..	..	..	..	55	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	129	32
..	..	..	..	..	..	..	..	..	..	44	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	55*	33
2	1	4	1	..	..	1	11	3	..	23	1	..	..	..	2	..	5	..	..	21	..	..	4	..	1	1	..	..	1	..	..	4	3	..	1	2	..	2	44	34
2	..	..	..	..	..	..	1	2	..	28	2	..	..	..	2	..	5	..	..	3	1	..	1	..	..	1	..	..	..	..	..	4	..	..	2	..	1	128	35
5	2	..	..	..	..	1	1	1	..	3	..	23	..	..	3	1	4	..	1	..	..	..	1	..	..	1	..	..	..	..	..	4	..	1	3	4	..	..	86	36
1	..	..	..	..	..	..	..	1	..	..	..	84	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	76	37
..	..	..	..	..	1	3	2	..	..	2	..	2	..	1	1	..	6	..	..	..	..	..	2	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	87	38
..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	3	..	37	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	1	..	..	1	24	39
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	..	142	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	52	40
..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	5	..	56	..	..	1	..	..	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	151	41
..	..	..	..	..	1	4	1	..	..	..	..	..	..	1	14	1	73	..	..	6	..	1	4	1	..	..	1	1	1	..	..	..	..	..	..	..	..	3	72	42
1	..	..	..	1	..	1	1	2	1	..	..	1	..	1	15	..	38	..	..	3	..	..	3	..	..	..	..	..	1	..	..	..	..	1	1	..	1	120	43
..	..	..	..	..	..	8	..	..	..	..	..	..	..	..	15	..	77	..	..	1	..	..	5	7	..	..	..	..	1	..	..	..	..	..	..	..	..	86	44
..	..	..	..	..	2	1	1	..	..	..	..	..	..	..	17	..	118	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	129	45
1	..	..	..	1	1	2	1	..	..	..	..	..	..	..	4	..	43	..	..	1	..	..	3	..	..	..	..	..	1	..	..	..	..	1	3	2	..	1	143	46
..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	2	..	72	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	71	47
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	59	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	77	48
1	..	1	1	..	..	..	..	2	..	..	..	..	..	..	1	..	3	36	..	5	..	..	3	1	3	..	..	..	..	3	..	..	..	..	..	..	..	60	49
..	..	1	2	..	..	..	..	1	1	1	..	..	..	..	2	..	2	23	..	..	..	..	2	..	2	..	2	..	..	..	..	1	..	..	..	..	..	78	50
..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	37	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	53	51
..	..	3	..	..	..	..	2	..	..	..	..	..	..	..	1	..	..	..	..	78	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	40	52
..	..	1	..	..	..	1	..	..	..	..	1	..	..	..	1	..	7	..	..	54	..	..	4	..	..	..	..	1	..	1	..	..	..	..	..	..	..	1	90	53
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	150	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	78	54
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	100	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	150	55
..	..	..	..	..	..	..	..	..	..	..	4	..	..	..	..	..	..	..	..	..	..	63	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	100	56
..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	14	..	3	..	..	2	..	..	77	..	..	..	..	..	..	..	..	5	..	..	1	1	..	78	57
..	1	..	..	..	..	1	1	1	..	..	..	..	..	..	31	..	3	1	..	2	..	..	107	2	..	..	..	..	1	..	..	..	1	..	..	..	..	105	58
..	..	1	..	..	..	5	..	..	..	1	..	..	..	..	14	..	9	2	..	3	..	..	74	..	1	..	..	..	..	..	..	5	1	..	..	..	1	127	61
1	..	..	..	..	..	1	2	..	..	..	..	..	..	..	2	..	6	1	..	1	..	..	21	..	..	..	2	..	..	..	..	..	1	..	..	..	2	50	62
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	99	..	..	..	..	..	..	..	..	..	1	..	..	..	..	100	63
..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	37	..	..	..	..	..	79	..	..	..	..	..	..	..	..	..	..	..	..	..	79	64
1	..	..	..	..	..	..	..	1	..	..	1	..	..	..	1	..	1	..	..	1	..	..	1	..	..	24	..	..	..	..	..	..	..	..	..	..	..	..	30	65
..	..	4	..	..	..	..	..	10	1	..	..	..	..	..	1	1	5	..	1	5	..	..	1	..	1	..	149	4	..	..	..	..	..	..	1	..	..	1	216	66
..	..	..	5	..	2	..	2	..	8	..	..	..	..	..	1	..	1	5	..	3	1	..	1	..	2	..	7	5	..	..	3	..	..	..	..	..	3	65	67
..	..	8	1	..	1	..	..	..	5	2	..	..	..	..	1	..	1	..	..	2	1	..	..	..	..	..	11	1	..	..	..	..	..	..	..	..	..	53	68
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	101	..	..	..	..	..	..	..	..	..	..	101	69
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	165	..	..	..	..	..	..	..	..	..	..	165	70
..	..	..	1	..	..	..	..	..	4	..	2	..	..	..	1	..	..	1	..	..	..	..	1	..	..	..	..	80	..	..	..	..	1	..	..	..	..	1	95	71
..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	45	..	..	..	..	..	..	..	..	1	54	72
..	..	..	..	7	..	8	..	..	..	..	..	..	..	5	3	..	7	..	..	..	..	..	2	..	..	..	..	..	..	15	..	..	..	..	..	..	..	1	51	73
..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	4	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	63	..	2	..	..	..	..	76	74
..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	1	3	..	1	..	..	..	..	..	..	1	..	..	..	67	..	4	..	..	..	1	84	75
..	..	..	..	..	..	..	..	..	..	..	3	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	66	..	..	1	1	..	76	76
..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	32	..	..	..	..	..	83	78
..	..	..	1	..	1	..	2	8	..	..	1	..	..	..	2	..	7	..	1	3	..	1	..	..	..	..	..	..	..	..	..	2	..	55	..	..	..	7	100	79
132	116	116	155	22	104	196	303	159	118	125	24	115	4	17	264	15	970	148	46	394	117	75	580	36	101	35	182	385	60	18	150	101	68	158	16	40	10	91	7,425	
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	60	..	60	80
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	71	1	73	81
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	57	1	59	82
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	57	2	64†	83
..	..	..	..	1	..	3	1	..	..	..	..	..	..	1	..	..	6	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	44	5	63	84
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	59	..	60	85
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	127	..	127†	86
..	..	..	..	1	..	6	2	..	..	..	..	..	..	..	1	..	14	..	..	1	..	1	2	..	..	..	..	..	..	..	..	6	..	1	..	..	47	14	108	87
..	..	..	..	1	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	115	2	121	88
..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	116	1	119†	89
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	31	1	32	90
0	0	0	0	3	0	11	3	0	0	0	0	0	0	3	1	0	26	0	0	1	0	1	4	2	0	0	0	0	0	0	0	6	0	1	0	0	784	27	886	
132	116	116	155	25	104	207	306	159	118	125	24	115	4	20	265	15	996	148	46	395	117	76	584	38	101	35	182	385	60	18	150	107	68	159	16	40	794	118	8,311	
14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	

There were 1,463 women in medical and basic science schools in the United States during 1952-1953, 8 less than last year. However, there were proportionately about the same number of women in medical school and entering medical school this year as in the previous year. They comprised 5.3% of all students as compared with 5.4% last year. Women in freshman classes totaled 399, or 5.3%, of the total as compared with 394, or 5.3%, last year. Women this year constituted 6.1% of all applicants to medical school as compared with 5.6% last year. The actual number of women graduates increased slightly. There were 363 women graduates, or 5.5% of the total, as compared with 351, or 5.7%, the previous year. Dartmouth and Jefferson had no women students and Woman's Medical College no men. The number of schools with more than 30 women was eight, one less than the previous year. Canadian schools had 224 women enrolled, or 6.5% of all students, and had 46 women graduates, constituting 5.5% of the total.

TABLE 18.—*Women in Medicine in the United States*

Year	Women Students	Percentage of All Students	Women Graduates	Percentage of All Graduates
1905	1,073	4.1	219	4.0
1910	937	4.0	116	2.6
1915	592	4.0	92	2.6
1920	818	5.8	122	4.0
1925	910	5.0	204	5.1
1926	935	5.0	212	5.4
1927	964	4.9	189	4.7
1928	929	4.5	207	4.9
1929	925	4.4	214	4.8
1930	955	4.4	204	4.5
1931	990	4.5	217	4.6
1932	955	4.3	208	4.2
1933	1,056	4.7	214	4.4
1934	1,020	4.5	211	4.2
1935	1,077	4.7	207	4.1
1936	1,133	5.0	246	4.7
1937	1,113	5.1	238	4.4
1938	1,161	5.4	237	4.6
1939	1,144	5.4	260	5.1
1940	1,145	5.4	253	5.0
1941	1,146	5.4	280	5.3
1942	1,164	5.3	279	5.4
1943	1,150	5.1	241	4.6
1944	1,176	5.0	239	4.7
1944 (2d session)	1,141	4.6	252	4.9
1945	1,352	5.6	262	5.1
1946	1,868	8.0	242	4.2
1947*	2,183	9.1	342	5.4
1948	2,159	9.5	392	7.1
1949	2,109	8.9	612	12.1
1950	1,806	7.2	595	10.7
1951	1,564	5.9	468	7.6
1952	1,471	5.4	351	5.7
1953	1,463	5.3	363	5.5

* Includes additional classes.

TABLE 19.—*Enrollment by Classes of Veterans and Non-Veterans in the Medical and Basic Science Schools in the United States, 1952-1953*

	Men Veterans	Other Men	Total Men	Women Veterans	Other Women	Total Women	Total Men and Women
Freshmen	1,115	5,911	7,026	4	395	399	7,425
Sophomores	1,473	5,236	6,709	7	347	354	7,063
Juniors	2,314	4,062	6,376	12	337	349	6,725
Seniors	3,004	3,110	6,114	13	348	361	6,475
Totals	7,906	18,319	26,225	36	1,427	1,463	27,688

Negro Medical Students

There were 715 Negro medical students, 2.6% of all students, enrolled in medical schools in the United States during 1952-1953. These students were enrolled in 49 schools, with 265 at Howard University, 259 at Meharry, and 191 at other schools. There were 203 freshmen, 180 sophomores, 168 juniors, and 164 seniors.

Veterans in Medical Schools

The number of veterans enrolled in medical and basic science schools declined again for the second year. There were 7,942 veterans enrolled, comprising 28.7% of the total student body, as compared with 11,436, or 42.2%, last year. There were 36 women veterans.

Enrollment figures for veteran and nonveteran students are recapitulated in table 19. The number of veterans enrolled continues to decline and the present freshman class has the smallest complement of veterans for any year since the end of World War II. Veterans comprised 15.2% of the freshman class or 7.3% less than last year. The percentages of veterans in other classes were: sophomores 21%, juniors, 34.6%, and seniors, 46.6%.

TABLE 20.—*Number of Individuals from Each State Applying to One or More Medical Schools*

State	Accepted			Not Accepted			Total		
	Men	Women	Total	Men	Women	Total	Men	Women	Total
Alabama	128	9	137	156	8	164	284	17	301
Arizona	25	0	25	28	0	28	53	0	53
Arkansas	107	7	114	83	3	86	190	10	200
California	367	31	398	625	61	686	992	92	1084
Colorado	78	4	82	70	5	75	148	9	157
Connecticut	91	3	94	198	7	205	289	10	299
Delaware	14	1	15	21	2	23	35	3	38
Dist. of Columbia	45	2	47	96	10	106	141	12	153
Florida	125	6	131	186	6	192	311	12	323
Georgia	152	8	160	85	4	89	237	12	249
Idaho	30	0	30	24	0	24	54	0	54
Illinois	347	19	366	409	25	434	756	44	800
Indiana	182	6	188	132	6	138	314	12	326
Iowa	134	7	141	46	3	49	180	10	190
Kansas	117	2	119	99	6	105	216	8	224
Kentucky	117	6	123	84	6	90	201	12	213
Louisiana	154	9	163	64	4	68	218	13	231
Maine	19	2	21	26	2	28	45	4	49
Maryland	106	8	114	95	7	102	201	15	216
Massachusetts	208	11	219	278	19	297	486	30	516
Michigan	296	24	320	228	14	242	524	38	562
Minnesota	162	6	168	94	7	101	256	13	269
Mississippi	110	5	115	94	1	95	204	6	210
Missouri	126	3	129	113	3	116	239	6	245
Montana	22	0	22	27	3	30	49	3	52
Nebraska	113	7	120	98	6	104	211	13	224
Nevada	2	0	2	4	0	4	6	0	6
New Hampshire	18	1	19	15	0	15	33	1	34
New Jersey	264	13	277	446	28	474	710	41	751
New Mexico	13	2	15	9	1	10	22	3	25
New York	933	67	1000	1596	119	1715	2529	186	2715
North Carolina	144	9	153	134	7	141	278	16	294
North Dakota	46	0	46	17	1	18	63	1	64
Ohio	395	17	412	375	28	403	770	45	815
Oklahoma	117	1	118	88	7	95	205	8	213
Oregon	66	5	71	68	4	72	134	9	143
Pennsylvania	548	51	599	868	54	922	1416	105	1521
Rhode Island	38	1	39	58	3	61	96	4	100
South Carolina	100	4	104	46	6	52	146	10	156
South Dakota	40	3	43	17	0	17	57	3	60
Tennessee	179	11	190	75	4	79	254	15	269
Texas	364	26	390	207	16	223	571	42	613
Utah	63	0	63	50	2	52	113	2	115
Vermont	18	2	20	13	0	13	31	2	33
Virginia	149	5	154	104	12	116	253	17	270
Washington	108	5	113	129	10	139	237	15	252
West Virginia	66	3	69	93	8	101	159	11	170
Wisconsin	153	17	170	108	7	115	261	24	285
Wyoming	15	0	15	14	0	14	29	0	29
Canada	6	3	9	58	4	62	64	7	71
U. S. Possessions	38	1	39	119	17	136	157	18	175
Foreign	62	10	72	167	17	184	229	27	256
Not Stated	15	0	15	70	5	75	85	5	90
Total Number of Individuals	7335	443	7778	8407	578	8985	15742	1021	16763

Stalnaker, John M. "The Study of Applicants for Admission to United States Medical Colleges, Class Entering in 1952-1953." Reprinted, with permission, from J. Med. Educ. **28**:21-28, Feb. 1953.

Geographic Source of Freshman Students

The residence of students at the time of their enrollment in the 1952-1953 freshman class in each medical and basic science school in the United States and Canada is

given in table 17. Since persons frequently change residence and may move to states other than those in which they were born, the home states listed in this table are not necessarily the states either of birth or of permanent residence.

The residences of 886 freshmen in Canadian schools are given at the bottom of table 17. This total differs from the total given in other tables, since it includes figures for the first classes of premedical students who are already registered at Queen's University, Laval, and Toronto.

mately the same proportion of out-of-state students admitted by these schools the previous year.

"The Study of Applicants" [5] prepared by the Association of American Medical Colleges provides additional interesting data on the geographic origins of medical students in the 1952-1953 freshman class. Table 20, which is reproduced from Mr. Stalnaker's study, presents an analysis of the total numbers of male and female applicants from each state, territory, and so on, together with the numbers accepted and rejected. About half of all

TABLE 21.—*Residence of Freshman Students in Medical and Basic Science Schools in the United States and Canada, 1952-1953*

United States	Home State	Other State	Territories and Possessions	Canadian	Foreign	Totals
Medical College of Alabama	80	0	0	0	0	80
University of Arkansas	90	0	0	0	0	90
College of Medical Evangelists	35	48	3	3	7	96
University of Southern California School of Medicine	60	8	0	0	0	68
Stanford University School of Medicine	55	7	0	0	0	62
University of California School of Medicine	72	4	0	0	1	77
University of Colorado School of Medicine	65	15	0	0	0	80
Yale University School of Medicine	12	65	2	0	0	79
Georgetown University School of Medicine	6	117	0	0	1	124
George Washington University School of Medicine	14	77	1	1	2	95
Howard University College of Medicine	6	64	0	0	9	79
Emory University School of Medicine	37	34	0	0	1	72
Medical College of Georgia	80	0	0	0	0	80
Chicago Medical School	10	65	0	0	0	75
Northwestern University Medical School	43	84	1	1	1	130
Stritch School of Medicine of Loyola Univ.	47	40	1	0	0	88
University of Chicago, The School of Med.	17	48	1	1	5	72
University of Illinois College of Medicine	168	0	0	0	0	168
Indiana University School of Medicine	145	5	0	0	1	151
State University of Iowa College of Medicine	113	7	1	0	0	121
University of Kansas School of Medicine	107	10	0	0	3	120
University of Louisville School of Medicine	86	14	0	0	1	101
Louisiana State Univ. School of Medicine	124	0	0	0	0	124
Tulane Univ. of Louisiana School of Medicine	18	110	3	0	2	133
Johns Hopkins University School of Medicine	5	61	0	2	7	75
University of Maryland School of Medicine	76	26	2	0	0	104
Boston University School of Medicine	32	35	0	0	6	73
Harvard Medical School	21	91	1	0	5	118
Tufts College Medical School	73	42	0	0	0	115
University of Michigan Medical School	176	23	2	0	2	203
Wayne University College of Medicine	70	0	0	0	0	70
University of Minnesota Medical School	119	9	0	0	1	129
University of Mississippi School of Medicine	27/28	55	0	0	0	27/28 5
University of Missouri School of Medicine	44	0	0	0	0	44
St. Louis University School of Medicine	23	101	2	0	2	128
Washington University School of Medicine	28	55	2	0	1	86
Creighton University School of Medicine	23	49	4	0	0	76
University of Nebraska College of Medicine	84	2	0	0	1	87
Dartmouth Medical School	1	22	1	0	0	24
Albany Medical College	37	14	0	0	1	52
University of Buffalo School of Medicine	56	16	0	0	0	72
Columbia University College of Physicians and Surgeons	73	44	0	0	3	120
Cornell University Medical College	38	46	1	0	1	86
New York Medical College, Flower and Fifth Avenue Hospitals	77	52	0	0	0	129
New York University College of Medicine	118	24	0	0	1	143
State University of New York College of Medicine, New York City	142	8	1	0	0	151
University of Rochester School of Medicine and Dentistry	43	25	2	0	1	71
State University of New York at Syracuse College of Medicine	72	4	0	0	1	77
University of North Carolina School of Med.	59	1	0	0	0	60
Duke University School of Medicine	36	42	0	0	0	78
Bowman Gray School of Medicine of Wake Forest College	23	30	0	0	0	53
University of North Dakota School of Med.	37	3	0	0	0	40
University of Cincinnati College of Medicine	78	11	1	0	0	90
Western Reserve University School of Med.	54	23	0	0	1	78
Ohio State University College of Medicine	150	0	0	0	0	150
University of Oklahoma School of Medicine	100	0	0	0	0	100
University of Oregon Medical School	63	13	1	1	0	78
Hahnemann Medical College and Hospital of Philadelphia	77	27	1	0	0	105
Jefferson Medical College of Philadelphia	107	57	3	0	3	170
Temple University School of Medicine	95	34	2	0	2	133
University of Pennsylvania School of Med.	74	52	0	0	1	127
Woman's Medical College of Pennsylvania	21	27	0	0	2	50
University of Pittsburgh School of Medicine	99	1	0	0	0	100
Medical College of South Carolina	79	0	0	0	0	79
University of South Dakota School of Med.	24	6	0	0	0	30
University of Tennessee College of Medicine	149	66	0	0	1	216
Meharry Medical College	7	55	0	0	3	65
Vanderbilt University School of Medicine	11	42	0	0	0	53
Southwestern Medical School of The University of Texas	101	0	0	0	0	101
University of Texas School of Medicine	165	0	0	0	0	165
Baylor University College of Medicine	80	14	0	0	1	95
University of Utah School of Medicine	45	8	0	0	1	54
University of Vermont College of Medicine	15	35	0	0	1	51
University of Virginia Department of Med.	63	13	0	0	0	76
Medical College of Virginia	67	16	0	0	1	84
University of Washington School of Medicine	66	8	1	1	0	76
West Virginia University School of Medicine	32	0	0	0	0	32
University of Wisconsin Medical School	81	2	0	0	0	83
Marquette University School of Medicine	55	38	0	0	7	100
Totals	5,089	2,195	40	10	91	7,425
Canada						
University of Alberta Faculty of Medicine	0	0	0	60	0	60
University of Manitoba Faculty of Medicine	1	0	0	71	1	73
Dalhousie University Faculty of Medicine	0	1	0	57	1	59
Queen's University Faculty of Medicine	0	5	0	57	2	64
University of Ottawa Faculty of Medicine	0	14	0	44	5	63
University of Western Ontario Faculty of Medicine	0	1	0	59	0	60
University of Toronto Faculty of Medicine	0	0	0	127	0	127
McGill University Faculty of Medicine	0	47	0	47	14	108
University of Montreal Faculty of Medicine	0	4	0	115	2	121
Laval University Faculty of Medicine	0	2	0	116	1	119
University of Saskatchewan School of Medical Sciences	0	0	0	31	1	32
Totals	1	74	0	784	27	886
Grand Totals	5,090	2,270	41	794	116	8,311

There were 14 schools that excluded all out-of-state students, one less than last year. There were five schools that admitted less than five out-of-state students.

Of the total of 3,677 freshmen admitted last year to state and municipally owned schools in the United States, 335, or 9.1%, were nonresidents as compared with 283, or 7.7%, the previous year. The percentage of nonresident students enrolled in these schools remains substantially below the 17.1% enrolled in 1941-1942, the last prewar year. In the privately owned schools last year 2,001 students, or 53.4%, were residents of states other than that in which the school was located. This is approxi-

applicants came from seven states. Ranked in order of the numbers of their applicants, these states were New York, Pennsylvania, California, Ohio, Illinois, New Jersey, and Texas. The first three of these states, New York, Pennsylvania, and California, each had approximately the same proportion of applicants admitted to medical schools (37 to 39%).

The total number of resident students, students from other states, students from territories and possessions of

5. Stalnaker, J. M.: Study of Applicants for Admission to United States Medical Colleges, Class Entering in 1952-1953, J. M. Educ. **28**: 21-28 (Feb.) 1953.

the United States, Canadian students, and students from foreign countries enrolled in each school in the United States and Canada are recapitulated in table 21. The number of first year students per 100,000 of population for each state is given in table 22. For the entire nation, there were 4.7 freshman medical students per 100,000 of inhabitants, approximately the same number as last year. The 11 states that have no medical or basic science

TABLE 22.—*Ratio of Freshman Students to State Populations, 1952-1953*

Numbers of Students per 100,000 Population [1] in the Medical and Basic Science Schools of the United States

*New Mexico	2.1	Wisconsin	4.5
*Nevada	2.2	Oregon	4.7
*Maine	2.5	South Carolina	4.7
*Arizona	3.0	Texas	4.7
California	3.0	Ohio	4.8
Missouri	3.1	Vermont	4.8
New Hampshire	3.2	District of Columbia	5.0
North Carolina	3.5	Iowa	5.0
West Virginia	3.5	*New Jersey	5.2
*Florida	3.8	Oklahoma	5.2
Georgia	4.0	*Wyoming	5.2
Illinois	4.0	Minnesota	5.3
Kentucky	4.0	South Dakota	5.3
*Delaware	4.1	Mississippi	5.4
*Idaho	4.1	Pennsylvania	5.4
Maryland	4.1	Colorado	5.5
Massachusetts	4.1	Louisiana	5.5
*Montana	4.1	Tennessee	5.6
Washington	4.1	Arkansas	5.7
Alabama	4.3	Kansas	5.8
Virginia	4.3	New York	6.4
Connecticut	4.4	North Dakota	7.7
*Rhode Island	4.4	Utah	8.1
Indiana	4.5	Nebraska	8.4
Michigan	4.5		
		United States	4.7

* State with no medical school.

1. Population Estimates, Current Population Reports. July 1, 1952, Series P-25, No. 70, March 24, 1953, Washington, D. C.

schools had an average of 3.7 first year students, the same number as last year. States that have medical schools had 4.9 students per 100,000 of population as compared with 5.2 last year and 4.9 the year before last.

Forty students from United States territories and possessions were admitted last year, 14 less than in 1951-1952. Ten Canadians, three more than last year, were admitted to medical schools in the United States. Of the

TABLE 23.—*Medical Schools Requiring an Internship*

United States

College of Medical Evangelists
University of Southern California School of Medicine
Stanford University School of Medicine
Chicago Medical School
Duke University School of Medicine [1]

Canada

University of Manitoba Faculty of Medicine
Dalhousie University Faculty of Medicine
University of Ottawa Faculty of Medicine
Laval University Faculty of Medicine
University of Montreal Faculty of Medicine

1. Degree not withheld until internship completed.

886 students entering Canadian schools, 75 or 23 more than last year were from the United States; 27 students entering those schools were from foreign countries.

Required Internships

The four schools in the United States and the five schools in Canada that require their students to complete an internship are listed in table 23. The discontinuance of this requirement by the College of Medical Evangelists and University of Minnesota during the current year represents the only change in the list since 1952. Although only these few schools require an internship, more than 99% of all medical graduates have for many years voluntarily served internships. In addition, a high proportion of medical graduates take additional hospital training after the internship.

Duke University gives the M.D. degree at the end of the four year medical course, but requires its students to sign a written agreement that they will spend two years training in a hospital or laboratory before entering practice. Several other schools permit substitution of a year of laboratory work for the internship. The number of United States students enrolled in intern years required by their schools is shown in table 6.

One year of internship is required as a prerequisite to licensure by the licensing boards of 26 states, the District of Columbia, Puerto Rico, and 5 territories and possessions. The internship requirement was instituted during the past year by South Carolina. Eleven boards require a rotating internship.

A list of boards with specific requirements for internships appears in table 24. Licenses of candidates from schools that require an internship are withheld by 10 states until completion of the internship (California, Connecticut, Iowa, Michigan, Oklahoma, Tennessee, Utah, Vermont, Washington, and Wisconsin). Certain states in addition to those listed in table 24 require internships of foreign medical graduates and of candidates seeking licensure on the basis of reciprocity or endorsement.

TABLE 24.—*Medical Licensing Boards Requiring a One Year Internship**

Alabama	Nevada	Vermont
Arizona [1]	New Hampshire	Washington [3]
California	New Jersey [2,4]	West Virginia
Colorado	North Dakota [3]	Wisconsin
Delaware [3]	Oklahoma [2]	Wyoming
District of Columbia	Oregon	Alaska [4,5]
Idaho	Pennsylvania [3]	Canal Zone
Illinois [3]	Rhode Island [2]	Guam
Iowa [2]	South Carolina	Hawaii
Kentucky	South Dakota	Puerto Rico [3]
Michigan [2,3]	Utah	Virgin Islands

* Some states require the internship for graduates of medical faculties abroad and from reciprocity or endorsement applicants.

1. Straight internship required.
2. Internship must be a rotating service.
3. Twenty-four month mixed or straight internship acceptable.
4. Two year residency in a specialty or one year of postgraduate work accepted.
5. Active practice for four years accepted in lieu of internship.

Hospitals approved for intern training by the Council on Medical Education and Hospitals of the American Medical Association are generally acceptable in those states that require an internship for licensure. The current list of approved internships will be published in the Sept. 26, 1953, issue of THE JOURNAL.

Preprofessional Requirements

The minimum educational requirement of the Council on Medical Education and Hospitals for students entering medical school after January, 1953, is three years of college training. Prior to this year the Council since 1918 had required two years of college and since 1938 had recommended three years. Although the present minimum requirement is three years, it is recommended that, in order to acquire a broad general education, premedical students take the full four year college course. In rare instances a medical school will be justified in admitting an exceptionally qualified student at the end of two years of college.

All state licensing boards require that an applicant for licensure present evidence of having completed at least two years of premedical study in college. Six states and Puerto Rico require three years. In tables 2, 3, and 4, the number of years of premedical work required by each medical school are shown.

College Record of the 1952-1953 Freshman Class

For the past three years, data have been reported on the scholastic records of students entering medical school. Since the colleges and universities use a number of different grading scales, it has been difficult to obtain data that are comparable. In previous years, the medical schools were asked to report the numbers of "A," "B," and "C" students admitted. Since a majority of institutions now prefer one of the numerical systems of grading, the medical schools were asked this year to report their figures on a four point scale in which 4.0 represents the highest grade attainable. For purposes of comparison, it should be noted that a grade of 3.6 to 4.0 on this scale is approximately equivalent to an "A" on the previous one, 2.6 to 3.5 grade a "B," and 1.6 to 2.5 equals a "C." The schools were requested to report the premedical scholastic records of the 1952 freshman class in three categories: those with grade point averages of 3.6 to 4.0, those with averages of 2.6 to 3.5, and those with averages of 1.6 to 2.5.

Seventy of the 79 medical and basic science schools in the United States were able to provide the data requested. Of the 6,491 freshman for whom figures are available, 18.0% had averages of 3.6 to 4.0, 67.5% had averages of 2.6 to 3.5, and 14.5% had averages of 1.6 to 2.5. Sixty-nine schools admitted students with college averages of 3.6 to 4.0. In this group fell 1,165 students, or 18.0% of the total. The largest number of such students admitted to one school was 96. All schools admitted students with averages of 2.6 to 3.5 and 4,384, or 67.5%, were in this category. Fifty-eight schools admitted students with averages of 1.6 to 2.5 and 942 students or 14.5% of the total were in this bracket. The largest number of students from this group admitted by one school was 94.

While the figures may not be strictly comparable to those compiled in previous years, it is worthy of note that while the proportion of students in the lowest grade bracket is about the same as last year (15%), there has been a decrease of 12% in the number in the highest bracket and a proportional increase in the middle group. It is of particular interest to note that in the 1950 freshman class, 40% of the students had "A" averages while 9.1% had "C" averages. In other words, while the proportion of students in the lower grade category has increased by about 5% in the past three years, the proportion in the highest category (A or 3.6 to 4.0) has decreased by 22%.

Official figures on the number of applicants to medical schools in the United States have been compiled by the Association of American Medical Colleges [5] from data provided by the schools. The number of individuals who applied for admission in the year 1952-1953 was 16,763 as compared with 19,920 in 1951-1952. This represents a decrease of 3,157 and is 5,516 less than the number who applied in 1950-1951. This is the fourth consecutive year in which the number of individual applicants has decreased, and this year's group is smaller by 7,671, or 31.4%, than that of the peak postwar year 1949-1950. Since 7,425 students were admitted to medical school during the past academic year, it may be calculated that one out of each 2.26 applicants was accepted. Last year, the ratio was one out of 2.68 students and in 1949-1950 it was one for 3.47.

It is also reported in this study that 5,215, or 31.1%, of those applying for admission in the 1951-1952 class had applied and been rejected during the previous year. Of this group, 38.5% were accepted last year. Among those applying to medical school for the first time in 1952-1953, 47.3% were accepted.

This report has emphasized in recent years that the difficulty of gaining admission to medical school has been grossly exaggerated. The statistics presented here amply confirm this fact. The situation in the past year, when there were 2.6 applicants for each place in medical school, was approximately comparable to the year 1929-1930 when there were 2.1 applicants for each available place.

The decline in the ratio of applicants to available places in medical school that has occurred in the past three years has been due not only to a decrease in the actual number of applicants but also to the significant expansion in the facilities for training physicians that has taken place in recent years, an expansion that is still continuing.

There are probably a number of causes for the shrinkage in the size of the applicant pool, and a complete analysis of this problem cannot be undertaken here. However, one major factor is the disappearance of the large backlog of veterans who completed their premedical training following the termination of World War II. Another factor, one that is certain to cause serious concern among medical educators, is the sharp decrease in the number of applicants with superior academic records. While, again, one can only speculate as to the cause, it seems likely that this drop is in no small measure due to increasing competition for such talent from other professional fields. If the present trend continues, many medical schools in this country may soon find themselves hard pressed to recruit adequate compliments of well-qualified students.

The 1953 Freshman Class

The 1952-1953 freshman class, with 7,425 students, was slightly smaller than the record class of 7,441 admitted in 1951-1952. Figures at present available suggest that the 1953-1954 freshman class may show some further slight reduction in the number of students admitted. This leveling off after a period of rapid and marked expansion in enrollments perhaps reflects an adjustment to operation of the present schools at or near their maximum capacity. However, there will be further, significant increases in enrollments when certain established schools complete expansion programs that are now under way and when several new schools, now in the final stages of development, are completed.

By June of this year the schools had already selected 7,068 students. Among the 6,646 men, 851, or 12.8%, were veterans (242, or 12.8%, less than the previous year). There were 422 women, of whom 4 were veterans. The Canadian schools by June had enrolled 675 students; the expected enrollment is 928.

Preparation for General Practice

Medical faculties and medical students alike show a continuing interest in education for family or general practice. Many medical schools report that their primary objective is the preparation of students for general practice and that the major emphasis in their teaching is on education for work in this field. A high proportion of the schools sponsor one or more programs specifically designed to introduce students to this type of practice.

The general objective of preparing students for general practice is implemented in a variety of ways in different schools. At the undergraduate level, this is accomplished through general practice preceptorships, home care and family study programs, general practice clinics, substitution of clerkships in general medical clinics for specialty clinic assignments, and lectures by outstanding general practitioners on the nature of general practice and the opportunities that it offers. In a number of states, scholarship funds have been established for the support of students who wish to practice in small towns or rural areas. Some schools have arranged affiliations with rural hospitals where students are assigned for a part of their clinical clerkship training. In their affiliated hospitals, 25 schools have organized internships and 18 are sponsoring residencies particularly designed to equip the physician for general practice.

Preceptorship Programs

Experimentation with general practice preceptorships is being continued in a number of schools. Three schools that formerly had such programs will discontinue them this year and one school which had planned to initiate a program in 1953 still has the plan under consideration. Thus, the total number of schools having such programs will be reduced from 25 to 21. Table 25 lists the schools that have established preceptorships.

The preceptorship is a required part of the medical course in 10 schools, 1 more than last year, and was elective in 11. The duration of preceptorship assignments ranges from 2 to 12 weeks, with an average of approximately 6 weeks. All of these programs are scheduled either during the summer between the third and fourth years or during the fourth year except at one of the two year basic science schools. Nineteen schools reported that last year a total of 917 students served preceptorship assignments.

TABLE 25.—*Medical Schools Offering Preceptorship Programs, 1952-1953*

University of Arkansas	University of Buffalo
College of Medical Evangelists	Duke University
Yale University	University of Oklahoma
Emory University	University of Oregon
Stritch School of Medicine	University of Pennsylvania
State University of Iowa	University of South Dakota
University of Kansas	University of Texas
University of Louisville	University of Vermont
Boston University	University of Washington
University of Nebraska	University of Wisconsin
Albany Medical College	

The faculties of 18 schools were reported to be in general satisfied with the preceptorships. It may be assumed that the three schools that discontinued such programs had not found them satisfactory; two additional schools, although indicating some dissatisfaction, are continuing the program.

Student Fees

Resident tuition fees in the 72 medical schools and the 7 schools of the basic medical sciences in the United States for the academic year 1953-1954 will range from $99 to $968 except for one school, which will charge a fee of $1,291. The median fee will be $715 as compared with $689 last year. The average fee will be $633 as compared with $623 in 1952-1953. Only 11 schools have announced any increase in fees for the coming academic year. These increases range from $10 to $119. The average tuition fee now stands at 164% of the average tuition fee in 1939-1940, which was $378. As pointed out in the preceding section, however, student fees will provide only 20.1% of the cost of operating the medical schools during the forthcoming year.

TABLE 26.—*Range of Annual Fees in Medical and Basic Science Schools in the United States and Canada*

	1952-1953 Number of Schools		1953-1954 Number of Schools	
	United States	Canada	United States	Canada
Less than $99	1	..	1	..
$100 to 199	4	..	4	..
200 to 299	6	..	3	..
300 to 399	6	3	9	2
400 to 499	11	6	11	7
500 to 599	7	2	7	2
600 to 699	5	..	3	..
700 to 799	6	..	7	..
800 to 899	26	..	26	..
900 to 999	6	..	7	..
1,000 and over	1	..	1	..
Totals	79	11	79	11

In table 26 the 90 medical schools and schools of the basic sciences in the United States and Canada have been arranged in groups according to the fees that will be charged resident students for the session 1953-1954. This table also gives comparable statistics for the year 1952-1953. The figures in this table represent one-fourth of the total fees charged students for the four years of the medical course, including tuition fees and minor charges such as those for matriculation, breakage, diploma, and graduation. Thirty-one schools in the United States make an additional charge for nonresident students. In 29 schools these charges range from $80 to $600. One school charges nonresident students an additional fee of $1,100 and another an additional fee of $2,130.

Cost of Attending Medical School

The schools were requested this year to estimate the cost to their students of attending medical school. They were requested to include in the estimates all essential costs such as tuition and other fees, books, equipment, travel, and living costs. Seventy-seven schools provided the data requested. The average minimum outlay was estimated at $1,682, with a high of $3,300, a median of $1,680 and a low of $733. Estimates of the average cost averaged $2,083, with a high of $4,500, a median of $2,000, and a low of $900.

When similar figures were requested of the schools three years ago the median minimum outlay was estimated at $1,473 as compared to $1,680 this year, and the median for the average outlay was $1,800 as compared to $2,000.

Scholarship and Loan Funds

This year for the first time the medical schools were requested to furnish information concerning the total amount of scholarship and loan funds available to their students from funds held by or directly controlled by the medical schools and/or their parent universities. The 62 schools that reported on scholarship funds had available an average of $12,014. The largest amount reported was $110,625, the lowest $300, and the median $7,500. Seventy-three schools reporting on loan funds had an average of $41,201 available, with a high of $500,000, a median of $41,201, and a low of $500.

These are by no means the sole sources of financial aid available to undergraduate medical students. Some state governments have scholarships for their own residents and in 12 states special subsidies are offered to students who will agree to practice in small towns or rural areas. Additional aid is provided through the Southern Regional Education Board whereby the governments of 11 Southern states have contracted with a group of Southern medical schools for the education of a certain number of their residents. Through the Western Governors' Conference, a similar compact has been developed by five Western states. A third regional education plan is being actively considered for the New England states, and three states, Vermont, New Hampshire and Maine, have already passed enabling legislation to facilitate the activation of such a plan.

Private and Governmental Medical Schools

The medical schools in the United States are listed in table 27 according to the nature of their ownership. There were no changes of ownership during the last year. Forty-one schools are owned by private nonprofit corporations exempt from federal taxation; 35 schools are owned by states and three by municipal governments.

Enrollments in the private schools during 1952-1953 totaled 14,517, or 52.4% of the total for the country. The enrollment in state and municipal schools was 13,171, or 47.6%. Both groups of schools have shown an increase in total enrollments in the last three years. The increase has been slightly greater proportionally in the government owned schools which in 1949-1950 enrolled 45.1% of all medical students as compared with 47.6% during 1952-1953.

Freshman students in private schools numbered 3,748, or 50.5% of the total, and 3,677, or 49.5%, in the state and municipal schools. There has been a gain in the past three years by the governmental schools of 1.9% of the total freshman students enrolled.

Statistics with respect to resident and nonresident student enrollment in state and municipal as compared with private schools are presented in the section on the geographic sources of freshman students. Budgets of state and municipal schools for 1953-1954 will total approximately $43,854,000 and for the private schools $43,550,000. For the government owned schools this represents an increase of $4,654,000 over a year ago and for the private schools an increase of $1,885,000. During the past three years the budgets of the state and municipal schools have increased approximately $12,854,000 while those of the private schools have increased by $7,000,000.

Tuition fees of state and municipal schools for residents of their own state will vary in 1953-1954 from $99 to $800, with a median of $406. For private schools, tuition fees will range from $508 to $1,291, with a median of $832.

TABLE 27.—*Medical Schools Classified by Ownership, 1952-1953*

Privately Owned

1. College of Medical Evangelists
2. Stanford University School of Medicine
3. University of Southern California School of Medicine
4. Yale University School of Medicine
5. Georgetown University School of Medicine
6. George Washington University School of Medicine
7. Howard University College of Medicine
8. Emory University School of Medicine
9. Chicago Medical School
10. Northwestern University Medical School
11. Stritch School of Medicine of Loyola University
12. University of Chicago, The School of Medicine
13. Tulane University of Louisiana School of Medicine
14. Johns Hopkins University School of Medicine
15. Boston University School of Medicine
16. Harvard Medical School
17. Tufts College Medical School
18. St. Louis University School of Medicine
19. Washington University School of Medicine
20. Creighton University School of Medicine
21. Dartmouth Medical School
22. Albany Medical College
23. Columbia University College of Physicians and Surgeons
24. Cornell University Medical College
25. New York Medical College, Flower and Fifth Avenue Hospitals
26. New York University College of Medicine
27. University of Buffalo School of Medicine
28. University of Rochester School of Medicine and Dentistry
29. Duke University School of Medicine
30. Bowman Gray School of Medicine of Wake Forest College
31. Western Reserve University School of Medicine
32. Hahnemann Medical College and Hospital of Philadelphia
33. Jefferson Medical College of Philadelphia
34. Temple University School of Medicine
35. University of Pennsylvania School of Medicine
36. University of Pittsburgh School of Medicine
37. Woman's Medical College of Pennsylvania
38. Meharry Medical College
39. Vanderbilt University School of Medicine
40. Baylor University College of Medicine
41. Marquette University School of Medicine

State Owned

1. Medical College of Alabama
2. University of Arkansas School of Medicine
3. University of California School of Medicine
4. University of Colorado School of Medicine
5. Medical College of Georgia
6. University of Illinois College of Medicine
7. Indiana University School of Medicine
8. State University of Iowa College of Medicine
9. University of Kansas School of Medicine
10. Louisiana State University School of Medicine
11. University of Maryland School of Medicine and College of Physicians and Surgeons
12. University of Michigan Medical School
13. University of Minnesota Medical School
14. University of Mississippi School of Medicine
15. University of Missouri School of Medicine
16. University of Nebraska College of Medicine
17. State University of New York College of Medicine at New York City
18. State University of New York at Syracuse, College of Medicine
19. University of North Carolina School of Medicine
20. University of North Dakota School of Medicine
21. Ohio State University College of Medicine
22. University of Oklahoma School of Medicine
23. University of Oregon Medical School
24. Medical College of South Carolina
25. University of South Dakota School of Medicine
26. University of Tennessee College of Medicine
27. Southwestern Medical School of The University of Texas
28. University of Texas School of Medicine
29. University of Utah School of Medicine
30. University of Vermont College of Medicine
31. Medical College of Virginia
32. University of Virginia Department of Medicine
33. University of Washington School of Medicine
34. West Virginia University School of Medicine
35. University of Wisconsin Medical School

Municipally Owned

1. University of Louisville School of Medicine
2. Wayne University College of Medicine
3. University of Cincinnati College of Medicine

Vacancies in Instructional Staffs

The total numbers of full-time faculty positions that medical schools were unable to fill have been reported for the past four years. This year the schools were asked to indicate which of these vacancies are in newly created positions and which were positions budgeted for in the academic year 1952-1953. These figures are summarized in table 28.

The total number of unfilled positions was 283, the highest number since the 441 reported in 1949, and it exceeds by 88 the number of vacancies reported last year. The 120 vacancies on the staffs of preclinical departments was 16 more than last year but less than in the other three preceding years. It is of interest that 47, or more than one-third of these vacancies, represented newly created positions. Anatomy, pathology and physiology,, as in the preceding two years, had the greatest number of vacancies. Pathology departments had 34 unfilled posts; anatomy and physiology departments each had 18.

TABLE 28.—*Number of New and Budgeted Unfilled Full Time Positions by Departments in the Medical and Basic Science Schools of the United States, 1953-1954*

	New	Budgeted 1952-1953	Number of Unfilled Positions
Preclinical departments			
Pathology	14	20	34
Anatomy	8	10	18
Physiology	7	11	18
Physiological Chemistry	4	12	16
Pharmacology	5	10	15
Microbiology	5	5	10
Bacteriology	4	5	9
Total	47	73	120
Clinical Departments			
Pediatrics	21	9	30
General Surgery	16	12	28
Psychiatry	9	16	25
Internal Medicine	11	12	23
Obstetrics and Gynecology	6	10	16
Radiology	5	8	13
Preventive Medicine and Public Health	5	5	10
Anesthesiology	3	..	3
Neurology	1	2	3
Ophthalmology	..	2	2
Orthopedic Surgery	..	2	2
Physical Medicine and Rehabilitation	1	1	2
Urology	..	2	2
Dermatology	..	1	1
Neurological Surgery	..	1	1
Otolaryngology	..	1	1
Otology	..	1	1
Total	78	85	163
Grand Totals	125	158	283

Clinical departments reported 163 unfilled billets, of which 78 or nearly half were new positions. The departments reporting the largest numbers of vacancies were pediatrics 30, general surgery 28, psychiatry 25, internal medicine 23, and obstetrics and gynecology 16. Pediatrics and surgery both had almost three times as many vacancies as in the preceding year. About two-thirds of the positions in pediatrics and almost half in surgery were in new posts. There were 30 schools that reported no vacancies in their full-time faculties.

The vacancies in newly created positions is of particular interest. These figures for the basic science departments probably result from the enlargement of these staffs made necessary by expansion of student enrollments; for the clinical departments they reflect the increasing tendency in recent years to employ full-time teachers, especially in the major clinical disciplines.

New Medical Schools

There have been several developments of importance during the past year with respect to the establishment of new medical schools and the expansion of schools of the basic medical sciences to full four year medical schools. Two new schools, the University of Puerto Rico School of Medicine and the University of British Columbia School of Medicine, had classes enrolled in the first three years of the medical school course during the past academic year and during the coming academic year will have students enrolled in all four classes. These schools will graduate their first classes in June, 1954. The University of North Carolina, which is expanding to a four year school, enrolled its first third year class during the past year, will have a fourth year class enrolled in 1953-1954 and will graduate its first class in June, 1954.

With respect to the eligibility of the graduates of these schools for internships during the year 1954-1955, the Council has adopted the following statement:

ELIGIBILITY OF 1954 GRADUATES OF NEW MEDICAL SCHOOLS FOR INTERNSHIPS

The Council on Medical Education and Hospitals has voted that students who will graduate from the University of North Carolina School of Medicine, the University of Puerto Rico School of Medicine and the University of British Columbia School of Medicine in 1954 will be considered as if they had graduated from an approved medical school. Hospitals approved for intern training will not lose their approved status if they accept these students for internships.

The development of these three schools of medicine has been followed closely by the Council. In accordance with long standing policy, however, approval is not granted to any medical school until representatives of the Council survey the school after instruction has been instituted in all four years of the medical school course. The first senior classes at these medical schools will not be enrolled until the fall of 1953. Inspection of these schools, therefore, cannot be carried out in time to include the findings of the surveys in the 1953 Educational Number of THE JOURNAL which will be used by hospitals for determining whether applicants for internship are graduates of an approved medical school. If these three schools are included in the Council's approved list in 1954, the work of all students in good standing at the schools at the time of the Council's representatives survey the schools will be fully accredited.

Another new school, the University of California at Los Angeles, which admitted its first freshman class in the fall of 1951, will have freshman, sophomore, and junior classes enrolled during the coming year. The University of Miami School of Medicine admitted its first freshman class in the fall of 1952 and during the coming academic year will have both a freshman and a sophomore class enrolled.

Statistics for these new schools do not appear in the various tables included in this report. By custom the Council includes in this report only statistics from approved medical schools. No medical school is eligible for consideration for admission to the list of approved medical schools until its full four year program is in operation.

The University of Mississippi, which is expanding from a school of the basic medical sciences to a four year medical school, has made substantial progress during the past year in the construction of a new medical school building and university hospital at Jackson. It is tentatively expected that a junior class will be enrolled in the fall of 1955. Construction of a new medical school building and hospital has also been started at West Virginia University, which is also expanding to a four year school; however, no date has been set for enrollment of a third year class.

The University of Missouri, which received an appropriation of 6 million dollars in 1952 to enable it to expand its basic science school to a four year school at Columbia, is proceeding actively with plans for the new physical plant. No date has yet been set for enrolling a third year class.

Yeshiva University in New York City, which announced two years ago its intention of developing a medical school, has named the school the Albert Einstein College of Medicine and is proceeding actively with plans for construction that it is hoped can be initiated in the fall of 1953. It is hoped that the first freshman class can be enrolled in the fall of 1955.

During the spring of 1953 the Florida legislature provided 5 million dollars as an initial appropriation for the development of a medical school by the University of Florida at Gainesville.

In Kentucky, interest in developing a medical school under the auspices of the University of Kentucky in Lex-

TABLE 29.—*Foreign Medical Schools*

List Prepared by the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges

On the basis of information presently available, the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges are of the opinion that medical institutions and medical organizations in the United States would be justified in considering current and past graduates of the following foreign medical schools on the same basis that they consider graduates of approved medical schools in the United States. This list is not final and will be supplemented as information is compiled for other schools.

Belgium

Free University of Brussels Faculty of Medicine
(Université Libre de Bruxelles Faculté de Médecine)
Catholic University of Louvain Faculty of Medicine
(Université Catholique de Louvain Faculté de Médecine or
Katholieke Universiteit te Leuven)
University of Ghent Faculty of Medicine
(Universiteit te Gent Faculteit der Geneeskunde, or
Université de Gand Faculté de Médecine)
University of Liège Faculty of Medicine
(Universite de Liège Faculté de Médecine)

Brazil

University of São Paulo Faculty of Medicine
(Universidade de São Paulo Faculdade de Medicina)

China

Peiping Union Medical College

This recommendation applies to all those graduates who were granted the degree of Doctor of Medicine from the date when the first degrees were conferred in 1924 until and including the class of 1943. The education of students in the last class, that of 1943, was interrupted by World War II; therefore, some students finally completed their studies as late as 1949. However, their diplomas were issued as of the class of 1943. Following the Communist conquest of China the name of this school was changed to the China Union Medical College. The recommendation does not apply to this school.

Denmark

University of Copenhagen Faculty of Medicine
(Kobenhavns Universitet Laegevidenskabelige Fakultet)

Finland

University of Helsinki Faculty of Medicine
(Helsingfors Universitet Medicinska Fakulteten)
Medical Faculty Turku University
(Turun Yliopiston Laaketieteellinen Tiedekunta)

Lebanon

American University of Beirut School of Medicine

Netherlands

University of Amsterdam Faculty of Medicine
(Universiteit van Amsterdam Geneeskunde Faculteit)
State University of Groningen Faculty of Medicine
(Rijks-Universiteit te Groningen Geneeskunde Faculteit)
State University of Leiden Faculty of Medicine
(Rijks-Universiteit te Leiden Faculteit der Geneeskunde)
State University of Utrecht Faculty of Medicine
(Rijks-Universiteit te Utrecht Faculteit der Geneeskunde)

Norway

University of Oslo Faculty of Medicine
(Kongelige Frederiks Universitet Medisinske Fakultet)

Sweden

Royal Charles University Medical Faculty, Lund
(Kungl. Karolinska Universitetet Medicinska Fakulteten)
Charles Medico-Surgical Institute, Stockholm
(Karolinska Medico-Kirurgiska Institutet)
Royal University of Uppsala Medical Faculty
(Kungl. Universitetet i Uppsala Medicinska Fakulteten)

Switzerland

University of Basel Faculty of Medicine
(Universität Basel Medizinische Fakultät)
University of Bern Faculty of Medicine
(Universität Bern Medizinische Fakultät)
University of Geneva Faculty of Medicine
(Université de Genève Faculté de Médecine)
University of Lausanne Faculty of Medicine
(Université de Lausanne Faculté de Médecine)
University of Zurich Faculty of Medicine
(Universität Zurich Medizinische Fakultät)

The recommendation with respect to the following medical schools in Switzerland applies only to those graduates of Swiss medical schools who hold the Swiss Federal Diploma issued by the Federal Department of the Interior (Eidgenoissisches Department Des Innern, Département Fédéral de L'Intérieur) and obtainable only by Swiss citizens who hold the Certificate of Medical Studies (Akademische Zeugnis, Certificat d'Études Médicales), or who hold one of the following certificates which the Swiss Universities issue to those, not citizens of Switzerland, who complete a course of study and pass examinations equivalent to those taken by Swiss citizens in qualifying for the Swiss Federal Diploma:

University of Basel—Academic Certificate on passing the medical examination for physicians (Akademische Zeugnis uber die bestandene Fachprufung fur Arzte).

University of Bern—Medical diploma on passing examination for medicine (Aerztliches Fakultats diplom uber die bestandene Fachprufung für Ärzte).

University of Geneva and University of Lausanne—Certificate of Medical Studies (Certificat d'Études Médicales).

University of Zurich—Medical diploma for Foreigners (Medizinisches Diplom für Ausländer).

United Kingdom

England

University of Birmingham Faculty of Medicine
University of Bristol Faculty of Medicine
University of Cambridge Faculty of Medicine
University of Durham Medical School, Newcastle-upon-Tyne
University of Leeds Faculty of Medicine
University of Liverpool Faculty of Medicine
University of London †
University of Manchester Faculty of Medicine
University of Oxford Faculty of Medicine
University of Sheffield Faculty of Medicine

Northern Ireland

Queen's University of Belfast Faculty of Medicine

Scotland

University of Aberdeen Faculty of Medicine
University of Edinburgh Faculty of Medicine
University of Glasgow Faculty of Medicine
University of St. Andrews Medical School, St. Andrews and Dundee

Wales

Welsh National School of Medicine, University of Wales, Cardiff

The recommendation applies only to those physicians trained in the United Kingdom who hold medical degrees from the universities listed. The recommendation does not apply to those physicians who received their medical training at these universities or their affiliated hospital medical schools but who did not complete the work for the degree and who obtained their qualifications only through the examinations of the licensing corporations of the United Kingdom.

† Work for the medical degree of the University of London is offered at the following hospital medical schools:

Charing Cross Hospital Medical School
Guy's Hospital Medical School
King's College Hospital Medical School
London Hospital Medical School
Middlesex Hospital Medical School
Royal Free Hospital School of Medicine
St. Bartholomew's Hospital Medical College
St. George's Hospital Medical School
St. Mary's Hospital Medical School
St. Thomas' Hospital Medical School
University College Hospital Medical School
Westminster Hospital Medical School

ington continues, and the legislative research commission is preparing a report on this project for submission to the 1954 session of the legislature.

There has been no action with respect to establishing new medical schools in New Jersey, Massachusetts, and Connecticut, three states that have been giving serious study to the possibility of establishing schools within recent years. In the New England states, however, considerable discussion is being given to a New England regional higher education plan, which would include a medical school. Vermont, Maine and New Hampshire have already passed enabling legislation for participation by those states in such a plan.

Foreign Medical Schools

In February, 1950, the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges first published a list of foreign medical schools whose graduates they recommend for consideration on the same basis as graduates of approved medical schools in the United States. The list is intended as a guide for institutions and organizations in this country who deal with foregn medical graduates and also as an aid to American students who plan to study medicine abroad.

Data on which this list is based are provided largely by American medical educators who, while on trips abroad, have volunteered to visit and report on foreign medical schools. In evaluating these data and developing the list, valuable assistance has been given by the Committee on Foreign Medical Credentials. This committee, established to advise the Council, is made up of representatives of a large number of private and governmental agencies which are concerned with medical education, medical licensure, and the problems of foreign trained physicians.

It has been emphasized that this list is a tentative one to which additional schools may be added as data are received that justify their inclusion. Hence, the absence of a school from the list does not necessarily imply that its educational program is unacceptable. It has not been possible to develop a satisfactory program for the evaluation of certain formerly reputable foreign schools whose programs are known to have deteriorated as a result of the war and subsequent events. Evaluation of the credentials of graduates from schools not named in the list is, therefore, a responsibility of those other agencies and organizations to whom such individuals apply for recognition. The Councils can offer no advance statement concerning schools which might in the future be included in the list.

Table 29 names the 50 schools now included in the list. The only change made during the past year was the inclusion of the Peiping Union Medical College. This school was renamed the China Union Medical College following the communist conquest of China and the recommendation does not apply to graduates of this latter school. The list is now accepted by 26 of the state licensing boards and by the National Board of Medical Examiners.

American Students In Foreign Medical Schools

Statistics were reported last year on the number of American students enrolled in foreign medical schools. The foreign schools were requested to furnish similar information again this year, and additional data were secured with the assistance of the Department of State and the National Selective Service System.

Figures for the 188 foreign schools from which data were secured are summarized in table 30. Countries are listed in order of the number of American students enrolled. A total of 1,734 students from the United States were enrolled in 72 foreign medical schools located in 22 different countries. As was true a year ago, the countries with the largest numbers of American students were

TABLE 30.—*Distribution of American Students in Foreign Medical Schools, 1952-1953*

Country	No. of Schools	No. of Replies	Schools with American Students	Total No of Students
Switzerland	6	5	5	471*
Spain	9	1	1	393*
Italy	21	10	8	199
Mexico	17	13	3	180*
France	16	10	7	85*
Germany	24	17	13	83
Belgium	5	4	4	64
Dominican Republic	1	1	1	60*
Netherlands	4	1	1	55
Austria	3	3	3	31
Ireland	5	4	4	30
Australia	4	3	3	18
Greece	1	1	1	11
Great Britain	26	21	6	10
Cuba	1	0	0	10*
Chile	3	1	0	9*
Argentina	6	4	2	6*
Uruguay	1	1	1	4*
Philippines	2	2	2	4
Colombia	5	5	2	3
Sweden	4	4	2	3
Denmark	2	2	1	2
Lebanon	2	2	1	2
Peru	1	1	1	1
Bolivia	5	5	0	0
Equador	3	2	0	0
Finland	2	2	0	0
Guatemala	1	1	0	0
Haiti	1	1	0	0
Honduras	1	1	0	0
Iceland	1	1	0	0
New Zealand	1	1	0	0
Norway	2	2	0	0
Paraguay	1	1	0	0
Venezuela	3	3	0	0
Totals	188	137	72	1,734*

* Included in total number of students are the following figures for students from Puerto Rico supplied by the Selective Service System.

Spain	386
Mexico	126
Dominican Republic	38
Cuba	10
Chile	9
France	5
Switzerland	2
Uruguay	2
Argentina	1
	579

Switzerland, Spain, and Italy. Other countries having more than 50 such students are Mexico, Germany, France, Belgium, the Dominican Republic, Austria, and the Netherlands. The footnote to table 30 indicates that about one-third of the entire student group are from Puerto Rico.

Table 31 recapitulates the figures for 1951-1952 and 1952-1953. Figures are available this year for 4 more countries and 13 more schools than last year. The number of foreign schools reporting American students has decreased by 6, but the total number of such students reported has increased by 613. The numbers of Puerto Rican students enrolled abroad has increased from 303 to 579.

Table 32 lists, in order, the schools with the largest numbers of American enrolled. This table is not comparable to the similar one prepared last year, since some schools for which data were available last year, for example, the University of Madrid, which had 150 American students, did not reply this year and others like the University of Lausanne, which this year reported 110 students, provided no data last year. The four schools with more than 100 American students enrolled were, in order, University of Geneva (180), University of Rome (150), National University of Mexico (113), and University of Lausanne (110).

TABLE 31.—*Distribution of American Students in Foreign Medical Schools, 1951-1953*

	No. of Countries	No. of Schools	No. of Replies	Schools with American Students	Total No. of Students
1951-1952	31	176	124	78	1,121*
1952-1953	35	188	137	72	1,734†

* Includes 303 students from Puerto Rico studying in 8 countries reported by Selective Service System.
† Includes 579 students from Puerto Rico studying in 9 countries reported by Selective Service System.

Figures which were received on the distribution of students by classes appear in table 33. In this group of 614 students, 70% are enrolled in the first three classes. Information is not available to explain, with certainty, the fact that the largest number of students are enrolled in second year classes. However, since a large portion of the first two years in many foreign medical schools is devoted to subjects which are usually included in premedical courses in this country, it is likely that many American students, by obtaining credit for premedical studies completed in the United States, have been able to gain admission to advanced standing. It is possible, therefore, that a substantial proportion of the second year group are students who were first admitted to foreign schools during the past academic year.

TABLE 32.—*Foreign Medical Schools with Largest Numbers of American Students Enrolled, 1952-1953*

Name of University	American Students Enrolled	Total Enrolment
Geneva (Switzerland)	180	728
Rome (Italy)	156	.....
National University (Mexico)	113*	6,000
Lausanne (Switzerland)	110	487
Bern (Switzerland)	87	600
Zurich (Switzerland)	77	842
Santo Domingo (Dominican Republic)	60	858
Paris (France)	59	6,994
Leiden (Netherlands)	55	1,547
Heidelberg (Germany)	39	975
Monterrey (Mexico)	34	.....
Brussels (Belgium)	32	659
Louvain (Belgium)	25	1,776
Padua (Italy)	25	1,385
Vienna (Austria)	21	1,476
Galway (Ireland)	19	187
Munich (Germany)	15	1,665
Basel (Switzerland)	15	540
Montpellier (France)	11	1,250
Athens (Greece)	11	1,800

* Includes 95 students from Puerto Rico.

The caution which was voiced in this section last year will bear repetition. Correspondence received by the Council from American students enrolled in foreign medical schools and information received from other sources indicate that many of these students hope that, at the end of a year or two, they will be able to transfer to an American school. The likelihood of their being able to do so is small, not only because American schools are filled to capacity but also because differences in the organization of the curriculum of foreign schools make it difficult to fit such students into the programs of American schools.

Students who plan to study medicine abroad are also cautioned to determine whether or not the credentials which they will obtain will be recognized in this country. It is apparent that many of these students have not fully informed themselves concerning the educational standards of foreign schools. While there are many such schools whose excellence is rather widely recognized in the United States, there are others whose credentials may not be accepted by the licensing authorities. Students who are planning to study medicine abroad are therefore urged to communicate directly with the licensing boards of states where they hope to practice and to determine in advance of enrollment whether or not the credentials which they will receive are acceptable.

TABLE 33.—*Enrollment of American Medical Students by Classes, 1952-1953*

Country	1st	2d	3d	4th	5th	6th
Australia	4	5	7	2	..	..
Austria	1	2	4	1	1	..
Belgium	8	36	5	6	3	2
Dominican Republic	5	6	5	3	2	1
England	3	..	1	1	1	..
France	47	11	7	2	1	2
Germany	25	18	9	8	1	1
Greece	3	5	..	1	1	1
Ireland	8	5	5	7	5	..
Italy	2	61	66	39	6	21
Lebanon	..	1	1	..	..	..
Mexico	23	5	5	2	..	1
Peru	..	1	..	..	..	..
Philippines	1	1	..	..	..	..
Scotland	..	1	..	..	..	2
Switzerland	..	14	12	47	10	4
Totals	130	172	127	119	31	35

* Only some of the schools supplied this information; therefore, the totals within some countries differ from those found in table 30.

The Council has prepared a compendium of information on foreign medical education and the status of foreign medical credentials in the United States.[6] Reprints of this publication will be furnished on request, without charge.

Postgraduate and Continuation Courses for Physicians

The Council on Medical Education and Hospitals has published semiannually in THE JOURNAL a listing of postgraduate and continuation courses for physicians for the past 17 years. The opportunities presented in these listings include a wide variety of fields in clinical medicine and the basic sciences. The courses offered are for variable periods. With the exception of the formal basic science courses, these courses are not usually intended to prepare physicians for certification by the American boards in the specialties. Some opportunities are offered, however, for review work in preparation for the examinations of the

6. To be published.

specialty boards. The current listing was published in the June 13, 1953, issue of THE JOURNAL.

This section is devoted to an analysis of the courses offered during the period July 1, 1952, to June 30, 1953. Brief mention is also made of some of the recent developments in postgraduate education. The statistical summaries are divided into three groups: short review courses of less than five days, courses of five days' duration or longer and, lastly, a group including clinical conferences, graduate assemblies, seminars, study, and circuit courses. Comparable figures are shown for the preceding seven years.

RECENT DEVELOPMENTS

Several institutions introduced new subjects this year. The American Diabetes Association, Inc., of New York conducted a four day program in Toronto on "Diabetes and Basic Metabolic Problems." Applications for this course exceeded the facilities available. A course in legal medicine and the elements of medical-legal litigation was given by the University of Texas Medical Branch at Galveston. The University of Buffalo Medical School presented a two day course for physicians on "The Laboratory in Clinical Diagnosis," designed to keep the practitioner up-to-date on developments in the laboratory sciences and to improve his diagnostic accuracy. The course included discussions of the basic physiology and biochemistry involved in laboratory diagnosis, evaluation of tests, and the interpretation and demonstration of selected procedures. The Extension Division of the University of California at Los Angeles was able to utilize the results of six years of research experience by the engineering department to present a six week's course in "Prosthetics." This course was open to occupational and physical therapists and prosthetists as well as physicians and was repeated a number of times in order to accommodate groups from various regions throughout the country.

Programs in general practice increased throughout the country. The Illinois Academy of General Practice sponsored a series of courses for its members at 10 widely separated centers throughout the state during March and April. Several of the medical schools in Chicago participated in this program. The Frank E. Bunts Educational Institute of the Cleveland Clinic Foundation inaugurated a two day general practice program in May. This course was sponsored jointly by the Institute and the Cuyahoga County Chapter of the American Academy of General Practice. Other organizations also added general practice refresher courses to their programs.

In many programs an effort in the direction of more individualized teaching methods was noted. The Los Angeles County Heart Association offered "Postgraduate Preceptorships in Cardiology" for the general practitioner. These preceptorships involved 12 sessions in which the physician-student and his preceptor discussed and interpreted the electrocardiograms and learned the latest methods of diagnosis and treatment while observing patients over a period of several visits. The new program of the Commission on Graduate Education of the Medical Society of the State of Pennsylvania included panel discussions, clinics, and round-table discussions.

Various postgraduate teaching techniques have been employed for the convenience of the practicing physician. Telephone seminars, consisting of panel discussions emanating from a central point to local county medical society groups throughout the state, were utilized by the state medical societies of Indiana, Kentucky, Pennsylvania, and Texas. Recordings of the Indiana program were used in Arizona for one of the programs of the state medical association. Recordings are also being developed as a mode of postgraduate communication by several other groups. Televised postgraduate programs of short duration were given by the universities of Alabama, Kansas, and Maryland. In all cases the program was televised intramurally, and surgery was the major subject presented. Plans are under consideration by a number of other institutions for the use of television in postgraduate programs. The American Cancer Society is planning a series of forty color television programs, all designed for the practicing physician. More and more medical schools are endeavoring to take their courses to the doctor in lieu of his coming to school. This is particularly true for the general practice refresher programs.

The Tennessee State Medical Association has just completed a circuit course on "Internal Medicine and Circulatory Diseases." Ten sessions were held in each of 50 teaching centers. In California, the state medical association utilized outlying centers for programs that in each case were presented by teams recruited from the faculties of the five medical schools of the state. Faculty members of the University of Colorado School of Medicine conducted one or two day postgraduate sessions at regular intervals in strategic centers. Similar programs were offered in Michigan, North Carolina, Pennsylvania, and Wisconsin.

In those states where ample clinical facilities are not available, medical schools in adjacent states have cooperated by sending teaching teams into these areas for one or more postgraduate programs. In this way, the physician in these states can obtain postgraduate training in or near his home community. The University of Utah School of Medicine sent a team to Arizona while the University of Colorado supplied teams in New Mexico and Wyoming as a part of its extension program. The University of Kansas School of Medicine presented an extensive program designed specially for physicians in nearby cities in Missouri. Several other medical schools contributed to the postgraduate needs of their region outside their own state, either by extension programs or special intramural programs for the physicians of these neighboring states.

The many different organizations and institutions who are engaged in postgraduate education have recognized the need for joint action or coordination in the interest of economy and efficiency of their various activities. In Massachusetts this has led to the development of the Postgraduate Medical Institute, which is sponsored by the three medical schools in Boston, the state medical society, the state health department, and representatives of a number of voluntary health agencies. By pooling resources and ideas, these organizations have been able to coordinate effort and to present a number of jointly spon-

sored programs. The initial experience with this program has proved successful, and it is planned to expand it for the coming year.

Coordination of the efforts of a number of interested groups is illustrated again by the course in "Treatment of Emergencies" conducted by the Southwestern Medical School of the University of Texas in association with the Texas Medical Association, Texas Academy of General Practice, the Dallas Southern Clinical Society, and the Postgraduate School of the University of Texas. Michigan and Wisconsin have been operating their programs on this basis for some time. Other states are considering adopting a similar pattern.

Recognizing the constant growth of interest and activity in the whole field of postgraduate medical education, the Council has been engaged for the past year in a comprehensive study of this field. This has involved personal visits to all of the major organizations and institutions involved in this kind of work, and first hand observation of a number of programs in action. Material derived from this survey is being supplemented by written data and information derived from a questionnaire study. It is hoped that the results of this study will be ready for publication some time early in 1954.

TABLE 34.—*Short Review Courses of Less Than Five Days' Duration, 1952-1953*

State Where Given	No. of Courses	State Where Given	No. of Courses
Arkansas	8	New Jersey	1
California	19	New York	60
Colorado	4	North Carolina	4
Connecticut	1	Ohio	8
Delaware	1	Oklahoma	11
District of Columbia	4	Oregon	4
Illinois	16	Pennsylvania	12
Indiana	3	South Carolina	2
Iowa	8	Tennessee	1
Kansas	15	Texas	24
Louisiana	2	Utah	8
Massachusetts	22	Vermont	9
Michigan	44	Virginia	5
Minnesota	18	Washington	7
Missouri	1	Wyoming	1
Nebraska	1		
Total			324

ANALYSIS OF COURSES OFFERED, 1952-1953

Courses of Less Than Five Days' Duration.—During 1952-1953, 30 states and the District of Columbia provided opportunities of less than five days' duration for physicians desiring to continue postgraduate study in or near their home communities. There were 324 courses offered. Table 34 lists these states and the number of courses given in each state. Thirty-eight subjects were covered. Table 35 lists the subjects and the number of courses given in each subject. The attendance numbered 9,452.

The courses varied in length from sessions of one hour or a series of five or more lectures to four days full time and consisted of organized courses, clinics utilizing hospital patients, lectures, and demonstrations. Of the 324 courses offered, 40 were four day courses, 121 were three day courses, 122 were two day courses, and 21 were given in one full day. The remainder of the courses were reported by lectures, sessions, or hours. Forty medical schools participated in 253 of the courses offered. Other sponsoring agencies included hospitals in 44 instances and the Medical Department of the Army, special societies, and a graduate school in the remainder of the courses.

These opportunties were offered in every month except August. Sixteen courses were offered continuously and 21 quarterly. The instructors were chosen from the faculties of medical schools and from physicians practicing in the state. Medical school instructors participated exclusively in 71 courses and 66 were given by physicians in the state, while combinations of medical school instructors and physicians located in the state and elsewhere gave the remainder.

TABLE 35.—*Short Review Courses of Less Than Five Days' Duration, 1952-1953*

Subject	No. of Courses Given
Allergy	1
Anatomy	2
Arthritis	4
Anesthesiology	9
Bacteriology	2
Basic Sciences	2
Biochemistry	9
Cardiovascular Diseases	19
Dermatology and Syphilology	16
Diabetes	5
Electrocardiography	11
Endocrinology	9
Endoscopy	1
Fractures	2
Gastroenterology	8
Geriatrics	3
Hematology	10
Internal Medicine	18
Malignant Disease	4
Medicine, General	54
Neurology and Psychiatry	11
Obstetrics and Gynecology	25
Ophthalmology	2
Orthopedics	1
Pathology	2
Pediatrics	15
Pharmacology	1
Physical Medicine	1
Physiology	2
Physiological Chemistry	5
Poliomyelitis	3
Proctology	3
Public Health	4
Pulmonary Disease	6
Radiology	17
Surgery	29
Urology	7
Venereal Disease	1
Total	324

TABLE 36.—*Postgraduate Courses of Five Days or Longer, 1952-1953*

State Where Given	No. of Courses	State Where Given	No. of Courses
Alabama	2	Michigan	21
Arkansas	2	Minnesota	6
California	73	Missouri	2
Colorado	5	New York	289
Connecticut	4	North Carolina	2
Delaware	1	Ohio	6
District of Columbia	12	Oklahoma	9
Florida	4	Oregon	11
Georgia	78	Pennsylvania	58
Illinois	128	Tennessee	6
Indiana	3	Texas	29
Kansas	12	Utah	2
Louisiana	4	Vermont	4
Maine	16	Washington	3
Maryland	58	Wisconsin	4
Massachusetts	1		
Total			805

These opportunities were of the type that would interest all practicing physicians. None were given for specialists only. The courses were both clinical and didactic or both. There were 74 courses offered devoted exclusively

to didactic instruction. The fees ranged from $5 to $200. The majority of the fees were less than $50. In 42 instances no fee was charged.

The increasing interest in courses of less than five days' duration was evidenced in that there were 128 more opportunities for this type of training than given in the comparable previous period. The attendance exceeded that of the session 1951-1952 by 1,998. The total attendance reported for 295 of the 324 courses offered was 9,452. Scheduled courses in this group that were canceled numbered 43.

TABLE 37.—*Postgraduate Courses of Five Days or Longer, 1952-1953*

Subject	No. of Courses Given
Allergy	7
Anatomy	40
Arthritis	3
Anesthesiology	22
Bacteriology	13
Basic Sciences	12
Biochemistry	1
Cardiovascular Disease	28
Dermatology and Syphilology	9
Diabetes	4
Electrocardiography	22
Electroencephalography	3
Endocrinology	1
Endoscopy	9
Fractures	4
Gastroenterology	12
Hematology	11
Histology	2
Industrial Medicine	6
Internal Medicine	49
Malignant Disease	7
Medicine, General	53
Neurology and Psychiatry	31
Obstetrics and Gynecology	48
Ophthalmology	15
Orthopedic Surgery	14
Orthopedics	8
Otolaryngology	35
Otology	11
Parasitology	6
Pathology	47
Pediatrics	41
Physical Medicine	7
Physiology	28
Poliomyelitis	2
Proctology	11
Public Health	19
Pulmonary Disease	17
Radiology	51
Surgery	79
Thoracic Surgery	1
Urology	14
Venereal Disease	2
Total	805

Courses of Five Days' Duration or Longer.—In centers where ample clinical facilities were available 805 postgraduate courses of five days' duration or longer were offered in 30 states and the District of Columbia during 1952-1953. The states that provided these opportunities and the number of courses that were given in each state are recorded in table 36.

The 805 programs varied from refresher courses of five or more days to intensive courses extending over several months. Courses in 43 subjects were given. Table 37 lists the subjects covered. For this type of training the total attendance was 23,793.

In 115 instances courses of five days' duration were offered. There were 374 courses given that were of more than five days' duration but less than one month, 166 courses ranged from one to three months, and in 150 instances the courses varied in length from four months to three years. Included among the 150 courses were 26 eight month courses, 14 covering 9 months, 35 one year in length, and one of three years. In 36 instances courses were arranged to suit the convenience and the time of the applicant.

TABLE 38.—*Clinical Conferences, Graduate Assemblies, Study and Circuit Courses and Seminars, 1952-1953*

State Where Given	No. of Courses	State Where Given	No. of Courses
Alabama	2	Montana	3
California	17	Nebraska	1
Colorado	5	New York	129
Connecticut	2	North Carolina	5
Delaware	2	Ohio	6
District of Columbia	2	Oklahoma	9
Illinois	9	Oregon	14
Indiana	1	Pennsylvania	1
Iowa	1	South Carolina	1
Kansas	3	Tennessee	5
Louisiana	1	Texas	7
Maryland	3	Vermont	6
Massachusetts	8	Virginia	1
Minnesota	1	Washington	1
Mississippi	2	Wisconsin	1
Missouri	4		
Total			253

Medical school facilities were used for 658 courses, hospitals for 46, and clinics for 6. In many instances two or all three of these sources were used in presenting an individual course. Hotel and other facilities were used for 30 courses. For 65 courses, the type of facility used was not specified. Instruction was both didactic and clinical for 452 courses, didactic only for 202, clinical only for 41, laboratory and didactic for 30, and unspecified in 80.

TABLE 39.—*Clinical Conferences, Graduate Assemblies, Study and Circuit Courses and Seminars, 1952-1953*

Subject	No. of Courses Given
Allergy	2
Anesthesiology	1
Cardiovascular Disease	17
Dermatology and Syphilology	3
Diabetes	3
Electrocardiography	4
Endocrinology	3
Fractures	1
Gastroenterology	5
Geriatrics	1
Hematology	12
Internal Medicine	3
Malignant Disease	7
Medicine, General	55
Neurology and Psychiatry	42
Nuclear Science	1
Obstetrics and Gynecology	5
Ophthalmology	35
Orthopedics	2
Otolaryngology	14
Otology	1
Pediatrics	5
Physical Medicine	1
Poliomyelitis	1
Pulmonary Disease	6
Radiology	3
Surgery	6
Urology	6
Venereal Disease	8
Total	253

The faculties of medical schools served as instructors in 560 courses. Additional instructors were specialists in their field, chosen mainly from physicians residing within the state in which the course was given but including as well physicians from outside the state. Courses were offered during every month from July, 1952, through June, 1953. In 170 instances they were arranged to suit the convenience of the physician students. Forty-three courses were offered continuously and nine quarterly. There were 43 courses whose enrollment was limited to specialists only. Fees ranged from $5 to $1,040. For 54 courses no fee was charged.

Forty-nine medical schools sponsored this type of training during 1952-1953. Other agencies participating included hospitals, special societies, state and county medical societies, health departments, graduate schools of medicine, and the government agencies.

Attendance for the 805 courses totaled 23,793. By comparison with the previous years, there was a marked decrease in the number of courses offered while the attendance exceeded the previous year by 6,282. Scheduled courses that were cancelled totalled 198.

as compared with the previous year showed a decrease of 9,607. Two programs were canceled.

SUMMARY

Some form of continuation study for practicing physicians was reported as being provided during 1952-1953 in all but 10 states. Table 40 summarizes for the three groups the number of courses given, the number for which attendance was reported, and the total attendance, together with comparable figures for seven previous years. While the total number of programs offered during 1952-1953 decreased by 487 as compared with the previous year, the total attendance showed only a decrease of 1,327. The figures reported show that the attendance at many of the individual courses increased in numbers. Further analysis will show that the decrease occurred only in the group of opportunities for training in courses of five or more days' duration.

A study of table 40 reveals some interesting trends. The number of courses offered rose rapidly following World War II, reaching a peak of 1,800 in the 1947-1948 period. A sharp and continuing decline then occurred, swinging upward again in 1950-1951. In 1951-1952 the trend was again upward, reaching the all time high in a seven year period. The figures for 1952-1953 were again downward and appear to show a greater interest in the shorter opportunities provided as contrasted with the more intensive courses.

A similar review of the attendance figures shows a parallel trend in the immediate postwar years, but with a marked drop occurring in the 1950-1951 records even after the number of courses had again started to rise. The number of courses offered in 1952-1953 was the lowest figure in the past five years, although the attendance record does not reveal a comparable decline.

Medical education is a continuous process, and it is the responsibility of every physician to keep abreast of advances in medicine. Data presented in this section is evidence that the physicians of the country recognize this responsibility. Institutions and agencies are continuing to attempt to provide opportunities of current interest. The popularity of programs developed is revealed by the attendance records. However, the variables in type, length and geographical location is another important factor to be given consideration by those currently giving courses or others planning programs.

TABLE 40.—*Postgraduate Courses Offered and Attendance, 1945-1953*

	Less Than Five Days' Duration			Five or More Days			Clinical Conferences, Graduate Assemblies, Study and Circuit Courses and Seminars			Total		
	Total Courses	Number Reporting Attendance	Attendance	Total Courses	Number Reporting Attendance	Attendance	Total Courses	Number Reporting Attendance	Attendance	Total Courses	Number Reporting Attendance	Attendance
1945-1946	154	128	4,140	1,070	1,043	19,991	52	52	21,824	1,276	1,223	45,955
1946-1947	239	205	16,274	1,291	1,137	23,062	21	21	20,475	1,551	1,363	59,811
1947-1948	496	478	31,569	1,279	1,183	24,878	25	25	26,356	1,800	1,686	82,803
1948-1949	304	262	16,821	1,074	984	28,507	67	67	38,058	1,445	1,313	83,386
1949-1950	161	161	10,523	1,080	1,080	24,087	129	129	40,708	1,370	1,370	75,318
1950-1951	420	420	7,438	1,067	1,047	14,890	79	74	23,855	1,566	1,541	46,183
1951-1952	206	204	7,454	1,543	1,442	17,511	120	119	40,970	1,869	1,765	65,935
1952-1953	324	295	9,452	805	805	23,793	253	241	31,363	1,382	1,341	64,608
Totals	2,304	2,153	103,671	9,209	8,721	176,719	746	728	243,609	12,259	11,602	523,999

APPROVED MEDICAL SCHOOLS IN THE UNITED STATES

ALABAMA

Birmingham

Medical College of Alabama, 620 S. 20th St., Zone 5.— Established in 1943 as a division of the University of Alabama. Located in Birmingham in 1944. In 1945 assumed title to Jefferson Hospital and Hillman Hospital, Birmingham. The Medical College of Alabama cares for all indigent patients of the county, maintenance of which is paid to the university on a per diem basis by the county. In 1943 the appropriation included one million dollars for the building of a new medical school which was completed and occupied in the Fall of 1951. With the increased facilities of this new building, the entering class of 1951 was increased to 80 students. First instruction in the Medical College of Alabama started June 4, 1945, with a junior class and this class was graduated in October 1946. On Oct. 8, 1945, the School of the Basic Medical Sciences on the University Campus, established in 1920, and its faculty, were absorbed into the new Medical College of Alabama. The medical college is coeducational. Minimum requirements are three years of college work. Tuition is as follows: for legal residents of Alabama $400 per academic year plus incidental fees of $45. Nonresidents of the state are charged an additional $250 each session. The registration for the 1952-1953 session was 271, graduates 54. The last session began for all classes on Sept. 19, 1952. The session ended for all classes on May 30, 1953. The next session for all four classes will begin Sept. 17, 1953, and will end on May 29, 1954. The dean is James J. Durrett, M.D.

ARKANSAS

Little Rock

University of Arkansas School of Medicine, 1209 McAlmont Street.— Organized in 1879 as the Medical Department of Arkansas Industrial University. Present title in 1899. In 1911 the College of Physicians and Surgeons united with it and it became an integral part of the University of Arkansas. The first class was graduated in 1880. Clinical teaching was suspended in 1918 but resumed in 1923. Coeducational since organization. The curriculum covers four sessions of nine months each. Entrance requirements are three years of collegiate work. The B.S. degree is conferred at the end of the second year. The fees for the four years for residents of Arkansas are $380 a year; enrollment is restricted to residents of Arkansas. The registration for the 1952-1953 session was 324, graduates 78. The last session began Sept. 22, 1952, and ended June 15, 1953. The next session will begin Sept. 21, 1953 and will end June 14, 1954. The dean is Hayden C. Nicholson, M.D.

CALIFORNIA

Loma Linda—Los Angeles

College of Medical Evangelists, Loma Linda; Boyle and Michigan Ave., Los Angeles 33.—Organized in 1909. The first class graduated in 1914. The laboratory departments are at Loma Linda; the clinical departments at Los Angeles. Coeducational since organization. Three years of college work are required for admission. The freshman, sophmore, and junior years consist of nine month academic sessions and the senior year will have in addition to the nine month session a four weeks' clinical clerkship during the summer between the junior and senior years. A 12 month internship in an approved hospital is required. The yearly tuitions, including fees, are respectively, $1,292.00, $1,280.50, $1,286.25, $1,303.75. The registration for 1952-1953 was 377; graduates 1953-A, 98; 1953-B, 93. The last session for freshman and sophmore students began on Aug. 31, 1952, and ended June 5, 1953, respectively. The junior session began on Sept. 7, 1952, and ended June 6, 1953. The senior session began June 8, 1952, and was completed June 7, 1953. The next session for freshman and sophmore students will begin Aug. 30, 1953, junior students Sept. 13, 1953, and senior students began June 8, 1953, and will end June 4, 1954, for the freshman and sophomore classes, June 5, 1954 for junior students, and June 6, 1954 for seniors. The president is Walter E. Macpherson, M.D., Los Angeles. The dean is Harold Shryock, M.D., Loma Linda.

Los Angeles

University of Southern California School of Medicine, 3518 University Ave., Zone 7.—Organized in 1895 as the University of Southern California College of Medicine. First class graduated in 1899. In 1908 it became the Los Angeles Medical Department of the University of California. In 1909 the College of Physicians and Surgeons, established in 1904, became the Medical Department of the University of Southern California. Its activities were suspended in 1920; reorganized in May 1928, under present title. Entrance requirements are three years of college work. An internship is required for graduation. Coeducational since organization. Annual fees amount to approximately $865. The registration for 1951-1952 was 275; graduates, 67. The last session began Sept. 15, 1952, and ended June 13, 1953. The next session will begin Sept. 21, 1953, and will end June 12, 1954. The dean is Gordon E. Goodhart, M.D.

San Francisco

University of California School of Medicine, Medical Center, San Francisco 22.—Organized in 1864 as the Toland Medical College. The first class graduated in 1864. In 1873 it became the Medical Department of the University of California. In 1909, by legislative enactment, the College of Medicine of the University of Southern California at Los Angeles became a clinical department but was changed to a graduate school in 1914. In 1915 the Hahnemann Medical College of the Pacific was merged and elective chairs in homopathic materia medica and therapeutics were provided. Coeducational since organization. Three years of collegiate work are required for admission. The work of the first year is given at Berkeley and that of the last three years at San Francisco. The medical course consists of four academic years, each containing two semesters of sixteen weeks each. The fees are $320 per academic year. Nonresidents are charged $250 additional each year. The registration for the 1952-1953 session was 301; graduates 72. The last session began Sept. 22, 1952 and ended June 18, 1953. The next class will begin Sept. 14, 1953 and will end June 17, 1954. The dean is Francis Scott Smyth, M.D.

Stanford—San Francisco

Stanford University School of Medicine, Stanford, 2398 Sacramento Street, San Francisco.—The main buildings are in San Francisco. The laboratories of anatomy, bacteriology and experimental pathology, chemistry and physiology are located on the campus at Stanford, which is thirty miles southwest of San Francisco adjoining the city of Palo Alto. The post office is Stanford. Organized in 1908, when by agreement the interests of Cooper Medical College were taken over. The first class graduated in 1913. Coeducational since organization. Three years of collegiate work are required for admission. The quarter plan is in operation. An internship is a requirement for graduation. The average fee for each of the four years is $780. The registration for 1952-1953 was 243, graduates 62. The last session for all classes began Sept. 29, 1952, and ended June 10, 1953. The next session will begin Sept. 28, 1953, and will end June 9, 1954. The acting dean is Windsor Cooper Cutting, M.D.

COLORADO

Denver

University of Colorado School of Medicine, 4200 East Ninth Avenue., Zone 7.—Organized in 1883. Classes were graduated in 1885 and in all subsequent years except 1898 and 1899. Denver and Gross College of Medicine were merged Jan. 1, 1911. Coeducational since organization. The entrance requirements are three years of collegiate work. The fees average $525 per academic year. Nonresidents are charged $2,130 additional each year. The registration for 1952-1953 was 313; graduates 73. The last session began Sept. 22, 1952, and ended June 6, 1953. The next session will begin Sept. 18, 1953, and will end June 5, 1954. The Director of the Medical Center is Francis R. Manlove, M.D.; the dean is Robert C. Lewis, Ph.D.

CONNECTICUT

New Haven

Yale University School of Medicine, 333 Cedar Street, Zone 11.—Initial organization of the School of Medicine was completed in 1812 following passage of a bill by the Connecticut General Assembly in 1810 granting a charter for "The Medical Institution of Yale College," to be conducted under joint supervision of the College and the Connecticut State Medical Society. Formally opened in 1913; first degrees conferred 1814. In 1884, with the approval of the Medical Society, the original charter was amended to place the school definitely in the control of the College as the Medical School of Yale College. The name Yale College was changed to Yale University in 1887 and the name of the Medical School was automatically changed. The present name was adopted in 1918. Coeducational since 1916. The requirements for admission are three years of college work. The fees average $829 per academic year. The registration for 1952-1953 was 290; graduates 64. The last session began Sept. 24, 1952 and ended May 30, 1953. The next session will commence Sept. 23, 1953 and will end May 29, 1954. The dean is Vernon W. Lippard, M.D.

DISTRICT OF COLUMBIA

Washington

Georgetown University School of Medicine, 3900 Reservoir Road, N.W., Zone 7.—Organized in 1851. First class graduated in 1852. The degree of Bachelor of Arts or Bachelor of Science or its equivalent from an approved college of arts and sciences is required for admission of non-veterans, but veterans may be admitted with a minimum of 90 semester hours of credit. The fees average $965 per academic year. Registration for 1952-1953 was 441; graduates 95. The last session for freshmen started Sept. 15, 1952, and ended May 23, 1953; the sophomore class started Sept. 15, 1952, and ended May 23, 1953; the junior class started Aug. 27, 1952, and ended May 15, 1953, and the senior class started on May 26, 1952, and ended on May 23, 1953. The date of graduation was June 8, 1953. The next session for freshmen and sophomores will begin Sept. 14, 1953, and end May 22, 1954; the juniors will be in session from Aug. 26, 1953, to May 14, 1954; the senior session began May 25, 1953, and will end May 22, 1954. The date of graduation will be June 7, 1954. The dean is Francis M. Forster, M.D. The regent and dean of students is Rev. Thomas J. O'Donnell, S.J.

George Washington University School of Medicine, 1335 H Street, N.W., Zone 5.—Organized in 1825 as the Medical Department of Columbian College. Also authorized to use the name "National Medical College." Classes were graduated in 1826 and in all subsequent years except in 1834-1838 and 1861-1863 inclusive. The original title was changed to Medical Department of Columbian University in 1873. In 1903 it absorbed the National University Medical Department. In 1904 by an Act of Congress the title of George Washington University was granted to the institution. Coeducational since 1884. Three years of college work are required for admission. The tuition is $850 per academic year. Registration for 1952-1953 was 347; graduates 92. The last session began Sept.

15, 1952, and ended May 27, 1953. The next session will begin Sept. 21, 1953, and will end on June 9, 1954. The dean is Walter A. Bloedorn, M.D.

Howard University College of Medicine, 520 W Street, N.W., Zone 1.—Chartered in 1867. Organized in 1869. The first class was graduated in 1871. Coeducational since organization. Negro students compose a majority of those in attendance. The minimum requirements are four years of collegiate work, but practically the bachelor's degree. The course covers four years of 33 weeks each. The fees are respectively: $526.75; $516.75; $486.75; $502.25. The registration for 1952-1953 was 289; graduates 67. The last session began Sept. 22, 1952, and ended June 5, 1953. The next session will begin Sept. 21, 1953, and will end June 4, 1954. The dean is Joseph L. Johnson, M.D.

GEORGIA

Atlanta

Emory University School of Medicine, 36 Butler St.—Organized in 1854 as the Atlanta Medical College. Classes graduated 1855 to 1861, when it suspended. Reorganized in 1865. A class graduated in 1865 and each subsequent year except 1874. In 1898 it merged with the Southern Medical College (organized in 1878) taking the name of Atlanta College of Physicians and Surgeons. In 1913 it merged with Atlanta School of Medicine (organized in 1905), reassuming the name of Atlanta Medical College. Became the School of Medicine of Emory University in 1915. Three years of collegiate work are required for admission. The course of study is four academic years; 36 weeks each in the first and second year; 40 weeks each in the third and fourth years. The fees for each of the four academic years are $800. The registration for 1952-1953 was 286; graduates 73. The last session for freshmen and sophomores began Aug. 28 and Sept. 2, 1952, and ended June 6, 1953. The last session for juniors and seniors began Aug. 4, 1952, and ended June 6, 1953. The next session for freshmen and sophomores will begin Aug. 27 and Sept. 1, 1953, and will end June 5, 1954. The next session for junior and senior classes will begin Aug. 3, 1953, and will end June 5, 1954. The dean is Richard Hugh Wood, M.D.

Augusta

Medical College of Georgia, University Place.—Organized in 1828 as the Medical Academy of Georgia, the name being changed to the Medical College of Georgia in 1829. After 1873 it was known as the Medical Department of the University of Georgia. On July 1, 1933, the name was changed to the University of Georgia School of Medicine. On Jan. 18, 1950 it became the Medical College of Georgia. Property transferred to the university in 1911. Classes were graduated in 1833 and all subsequent years except 1862 and 1863. Coeducation was begun in 1920. Three years of college work are required for admission. Fees for 1953-1954, $390.00 per academic year for residents of Georgia, non-residents, $690.00. Only bona fide residents of Georgia admitted (with exception of A. S. T. and V-12 Program students during World War II). The registration for the 1952-1953 session was 314; graduates 81. The 1953-1954 session for the fourth year class will begin Sept. 10, 1953, and end June 5, 1954; the first, second and third year classes will begin Sept. 17, 1953, and end June 5, 1954. The president is Edgar R. Pund, M.D.

ILLINOIS

Chicago

Chicago Medical School, 710 South Wolcott Ave.—Founded in 1912 as the Chicago Hospital College of Medicine. In 1919 the name of the institution was changed to the Chicago Medical School. The school moved from its former location to its present site in the Medical Center in 1930. The Chicago Medical School is a nonsectarian, coeducational institution. It is chartered in the State of Illinois as a nonprofit institution. A collegiate degree is required for admission. A hospital internship is a requirement for graduation. The yearly tuition and fees are, respectively, $664, $872, $837, $649. The registration for 1952-1953 was 280; graduates 63. The last session for freshmen began Sept. 29, 1952, and for sophomores June 30, 1952, and ended June 20, 1953; the junior and senior session began Sept. 29, 1952, and ended for seniors June 27, 1953. The junior class will end Sept. 26, 1953. The next session for freshmen, juniors and seniors will begin Oct. 5, 1953, and will end June 20, 1954, Sept. 26, 1954, and June 26, 1954, respectively. The sophomore class began July 6, 1953, and will end June 25, 1954. The president is John J. Sheinin, M.D. The dean of faculty is F. J. Mullin, Ph.D.

Northwestern University Medical School, 303 East Chicago Avenue, Zone 11.—Organized in 1859 as the Medical Department of Lind University. First class graduated in 1860. In 1864 it became independent as the Chicago Medical College. It united with Northwestern University in 1869 but retained the name of Chicago Medical College until 1891, when the present title was taken. Became an integral part of Northwestern University in 1905. Coeducational since 1926. The requirement for admission is three years of collegiate work. The B.S. in medicine degree may be conferred before the end of the senior year. The total fees are $830 each year. The registration for 1952-1953 was 522; graduates 128. The last session began Oct. 1, 1952 for freshmen, sophomores and juniors and ended June 13, 1953. The senior session began June 18, 1952, and ended June 15, 1953. The next session will begin Sept. 30, 1953, for freshmen, sophomores and juniors and will end June 12, 1954. The senior session began June 17, 1953, and will end June 14, 1954. The dean is Richard H. Young, M.D.

Stritch School of Medicine of Loyola University, 706 South Wolcott Avenue, Zone 12.—Organized in 1915 by acquisition of Bennett Medical College, which had been organized in 1869. Facilities enlarged by the acquisition of Chicago College of Medicine and Surgery. Faculties in basic sciences put on full time basis and assumed name of Loyola University School of Medicine in 1917. Operated as an organic part of Loyola University. Name officially changed to Stritch School of Medicine of Loyola University on April 15, 1948. Coeducational since organization. Three years of collegiate work are required for admission. The fees are $675 a year. The registration for 1952-1953 was 334; graduates 80. The last session for freshmen, sophomores and juniors began Sept. 29, 1952, and ended June 20, 1953; the session for seniors began Sept. 8, 1952, and ended June 6, 1953. The next session will begin Sept. 28, 1953, and will end June 19, 1954, for the first two classes and will begin Sept. 8, 1953, and end June 5, 1954, for juniors, May 29, 1954 for the seniors. The dean is John F. Sheehan, M.D.

University of Chicago, The School of Medicine, 58th Street and Ellis Avenue, Zone 37.—Organized in 1924, as a part of the Ogden Graduate School of Science of the University of Chicago. In 1932, when the University of Chicago reorganized its departments, the medical departments were included in the Division of Biological Sciences. The work of the first two years in the medical courses has been given on the University Quadrangles since 1899; but the last two years were offered only at Rush Medical College, which was affiliated with the university until 1927 when actual work in the clinical departments on the campus began. After that time candidates for the degree of Doctor of Medicine could take the work of the first two years on the campus and the work of the third and fourth years either on the campus or at the Rush Medical College. In June 1940 Rush Medical College became affiliated with the University of Illinois College of Medicine. All undergraduate instruction is now given only on the campus of the University of Chicago. A special function of the school is to train people for making contributions to the advancement of medical science. The requirements for admission are three years of collegiate work. The curriculum covers twelve quarters of work. The tuition fee averages $904. The registration for 1952-1953 was 281; graduates 67. Quarters begin in March, June, September and December of each year. The dean of the Division of the Biological Sciences is Lowell T. Coggeshall, M.D. All correspondence pertaining to student affairs, including admission, should be addressed to Joseph J. Ceithaml, Ph.D., dean of students.

University of Illinois College of Medicine, 1853 West Polk Street, Zone 12.—Organized in 1882 as the College of Physicians and Surgeons. The first class graduated in 1883. It became the Medical Department of the University of Illinois by affiliation in 1897. Relationship with the university was canceled in June 1912, and was restored in March 1913, when the present title was assumed. The staff of the Rush Medical College was incorporated in the University of Illinois College of Medicine in 1942 and at the same time Presbyterian Hospital, Chicago, became a teaching unit of the university. Coeducational since 1898. Three years of collegiate work are required for admission. The B.S. in medicine degree may be conferred at the end of the second year. The fees for residents of Illinois average $313 per academic year; nonresidents pay an additional fee of $300. The registration for the 1952-1953 session was 678; graduates 174. The last session began Sept. 29, 1952, and ended June 27, 1953. The next session will begin Sept. 28, 1953, and will end June 26, 1954. The acting dean is Roger A. Harvey M.D.

INDIANA

Bloomington-Indianapolis

Indiana University School of Medicine, Bloomington; 1040 West Michigan Street, Indianapolis 7.—Organized in 1903 but did not give all the work of the first two years of the medical course until 1905. In 1907 by union with the State College of Physicians and Surgeons, the complete course in medicine was offered. In 1908 the Indiana Medical College, which was formed in 1905 by the merger of the Medical College of Indiana (organized in 1878), the Central College of Physicians and Surgeons (organized in 1879), and the Fort Wayne College of Medicine (organized in 1879) merged into it. The first class was graduated in 1908. Coeducational since organization. Three years of college work are required for admission. The work of the first two semesters is given at Bloomington; the remainder of the work at Indianapolis. Regular fee for two semesters of work is $300 for residents of Indiana and $560 for nonresidents. The registration for the 1952-1953 session was 568; graduates 134. The last session began Sept. 22, 1952, and ended June 9, 1953. The next session will begin Sept. 21, 1953, and will end June 8, 1954. The dean is John D. Van Nuys, M.D., Indianapolis.

IOWA

Iowa City

State University of Iowa College of Medicine, University Campus.—Organized in 1869. First session began in 1870. First class graduated in 1871. Absorbed Drake University College of Medicine in 1913. Coeducational since 1870. Three years of collegiate work are required for admission. The B.A. degree in the combined course of liberal arts and medicine is conferred. The tuition fee is $256 each year for residents of Iowa and $566 for nonresidents. The registration for 1952-1953 was 453; graduates 103. The last session began Sept. 25, 1952, and ended June 12, 1953. The next session will begin Sept. 24, 1953, and will end on June 11, 1954. The dean is Norman B. Nelson, M.D.

KANSAS

Lawrence-Kansas City

University of Kansas School of Medicine, Lawrence; 39th and Rainbow Boulevard, Kansas City.—Organized in 1880. It offered only the first two years of the medical course until 1905, when it merged with the Kansas City (Mo.) Medical College, founded in 1869, the College of Physicians and Surgeons, founded in 1894, and the Medicochirurgical College, founded in 1897. Absorbed Kansas Medical College of Topeka in 1913. The first class graduated in 1906. At present the first year is given on the University campus at Lawrence while the remaining three years are given at the Medical Center in Kansas City, Kansas. Coeducational since 1880. The requirement for admission is three years of collegiate work, four years preferred. The fees are $475 per year; the nonresident fees are $925

per year. The registration for 1952-1953 was 450; graduates 103. The last session began June 3, 1952, and ended May 30, 1953. The next freshman class will begin Sept. 9, 1953. The sophomore class of 1953 will begin its work on Sept. 17, 1953, at Kansas City. The junior and senior classes began June 9, 1953, and will end May 29, 1954. Three-fourths of each junior and senior class is in school each quarter of the school year while one-fourth is on vacation (juniors) or preceptorship (seniors). The dean is W. Clarke Wescoe M.D., Kansas City.

KENTUCKY

Louisville

University of Louisville School of Medicine, 101 West Chestnut Street, Zone 2.—Organized in 1837 as Louisville Medical Institute. The first class graduated in 1838, and a class graduated each subsequent year except 1863. In 1846 the name was changed to University of Louisville Medical Department. In 1907 it absorbed the Kentucky University Medical Department; in 1908, the Louisville Medical College, the Hospital College of Medicine and the Kentucky School of Medicine. In 1922 its name was changed to the University of Louisville School of Medicine. Coeducational since organization; became non-segregational in 1951. Three years of collegiate work are the minimum requirements for admission. Tuition is $800 for residents of Kentucky and $1,200 for nonresidents, per school year. These figures include special fees excepting graduation fee of $10. The registration for 1952-1953 was 385; graduates 100. (Administratively, the school year is divided into two semesters and students are accepted for matriculation only at the beginning of the first semester. Academically, the senior and junior years are on a trimester basis, the sophomore year is divided into four unequal periods, and the freshman year into three unequal periods.) The last session began Sept. 15, 1952, and ended June 6, 1953. The next session begins on Sept. 14, 1953, and will end on June 5, 1954. The dean is J. Murray Kinsman, M.D.

LOUISIANA

New Orleans

Louisiana State University School of Medicine, 1542 Tulane Avenue, Zone 12.—Organized January 1931 as Louisiana State University Medical Center. Present title in 1939. Coeducational. First session began in October 1931 with students of first and third years. Course covers four sessions of not less than 36 weeks each. A minimum of three years' collegiate work is required for admission. Total fees, $120 each year for residents of Louisiana; additional tuition of $400 each year for nonresidents. The registration for 1952-1953 was 457; graduates 105. The last session began Sept. 2, 1952 and ended June 1, 1953. The next session will begin Aug. 31, 1953 and end May 29, 1954. The dean is William W. Frye, M.D.

Tulane University of Louisiana School of Medicine, 1430 Tulane Avenue, Zone 13.—Organized in 1834 as the Medical College of Louisiana. Classes were graduated in 1836 and in all subsequent years except 1863-1865, inclusive. It became the Medical Department of the Tulane University of Louisiana in 1884. Present title in 1913. Coeducational since 1915. A minimum of three years of collegiate work is required for admission. Total fees average $800 per academic year. The registration for the 1952-1953 session was 514; graduates 128. The last session began on Sept. 15, 1952, and ended on June 2, 1953. The next session will begin Sept. 14, 1953, and will end June 1, 1954. The dean is M. E. Lapham, M.D.

MARYLAND

Baltimore

Johns Hopkins University School of Medicine, 710 North Washington Street.—The nucleus of a medical faculty was constituted in 1883. Systematic postgraduate instruction in pathology and bacteriology was begun in 1886. School was fully organized and opened in 1893. The first class graduated in 1897. Coeducational since organization. The requirement for admission is a college degree. The course extends over four years of eight and one-half months each. The fees averaged $835 per academic year. The registration for 1952-1953 was 294; graduates 76. The last session began on Sept. 29, 1952, and ended June 9, 1953. The next session will begin Sept. 28, 1953, and will end June 8, 1954. The dean is Philip Bard, Ph.D.

University of Maryland School of Medicine and College of Physicians and Surgeons, 522 W. Lombard Street, Zone 1.—Organized in 1807 as the College of Medicine of Maryland. The first class graduated in 1810. In 1812 it became the University of Maryland School of Medicine; Baltimore Medical College was merged with it in 1913. In 1915 the College of Physicians and Surgeons of Batimore was merged and the present name assumed. Coeducational since 1918. Three years of college work are required for admission. The tuition fees average $533 for residents of the state; for nonresidents $250 additional. The registration for 1952-1953 was 395; graduates 92. The last session began Sept 18, 1952, and ended June 6, 1953. The next session will begin Sept. 17, 1953, and will end June 5, 1954. The dean is H. Boyd Wylie, M.D.

MASSACHUSETTS

Boston

Boston University School of Medicine, 80 East Concord Street, Zone 18.—Organized in 1873 as a homeopathic institution. In 1874, the New England Female Medical College, founded in 1848, was merged into it. The first class was graduated in 1874. Became nonsectarian in 1918. Coeducational since organization. Applicants are required to present a minimum of three years of premedical work. Total fees averaged $871 per year. The registration for 1952-1953 was 278; graduates 72. The last session for freshmen, sophomores, and juniors began Sept. 15, 1952, and ended May 29, 1953. The last senior class began June 9, 1952, and ended June 8, 1953. The present senior class began June 15, 1953, and will end June 7, 1954. All other classes will be enrolled Sept. 14, 1953, and the session will end May 29, 1954. The dean is James M. Faulkner, M.D.

Harvard Medical School, 25 Shattuck Street, Zone 15.—Organized in 1782. The first class graduated in 1788. At least two years of collegiate work are required for admission. The fees average $850. The registration for 1952-1953 was 529; graduates 148. The last session began Sept. 22, 1952, and ended on June 11, 1953. The next session for freshmen, sophomores and juniors will begin Sept. 28, 1953, and will end June 17, 1954. The senior class began on June 8, 1953, and will end June 17, 1954. The dean is George Packer Berry, M.D.

Tufts College Medical School, 136 Harrison Avenue, Zone 11.—Organized in 1893 as the Medical Department of Tufts College. The first class graduated in 1894. Coeducational since 1894. A bachelor's degree is required for admission. Enrollment is generally limited to residents of the New England States. The course covers four years. Total fees for each of the four years, respectively, $863, $858, $858, $868. The registration for 1952-1953 was 438; graduates 97. The last session for freshmen, sophomores and juniors began Sept. 24, 1952; for seniors June 9, 1952, and all classes ended June 14, 1953. The present session began for the seniors on June 15, 1953, and for the other classes will begin Sept. 23, 1953, and will end June 13, 1954. The dean is Joseph M. Hayman, Jr., M.D.

MICHIGAN

Ann Arbor

University of Michigan Medical School.—Organized in 1850 as the University of Michigan Department of Medicine and Surgery. The first class graduated in 1851. Present title assumed 1915. Coeducational since 1870. The entrance requirements are three years of collegiate work. The fees average $400 per academic year; nonresidents $700 a year. The registration for 1952-1953 was 683; graduates 137. The last session began Sept. 22, 1952, and ended June 13, 1953. The next session will begin Sept. 21, 1953, and will end June 12, 1954. The dean is A. C. Furstenberg, M.D.

Detroit

Wayne University College of Medicine, 1512 St. Antoine Street, Zone 26.—Organized as the Detroit College of Medicine in 1885 by consolidation of the Detroit Medical College (organized in 1868) and the Michigan College of Medicine (organized in 1879). Reorganized with the title of Detroit College of Medicine and Surgery in 1913. The first class graduated in 1869. In 1918 it became a municipal institution under the control of the Detroit Board of Education. In 1934 the name was changed by action of the Detroit Board of Education to Wayne University College of Medicine, as a part of the program of consolidation of the Detroit city colleges into a university system. Coeducational since 1917. Entrance requirement is three years in an accredited college or university. Until further notice, enrollment is limited to residents of the State of Michigan. The fees average $537 for the school year. The registration for 1952-1953 was 268; graduates 59. The last session began Sept. 15, 1952, and ended June 13, 1952. The next session will begin Sept. 14, 1953, and will end June 12, 1954. The dean is Gordon H. Scott, Ph.D.

MINNESOTA

Minneapolis

University of Minnesota Medical School, Zone 14.—Organized in 1883 as the University of Minnesota College of Medicine and Surgery and reorganized in 1888 by absorption of the St. Paul Medical College and Minnesota Hospital College. The first class graduated in 1889. In 1908 the Minneapolis College of Physicians and Surgeons, organized in 1883, was merged. In 1909 the Homeopathic College of Medicine and Surgery was merged. Present title in 1913. Coeducational since organization. The entrance requirements are three years of university work. Students are required to meet the requirements for a degree of B.S. or B.A. before receiving the degree of Doctor of Medicine (M.D.), which is granted at the end of the course. Total fees are $352.05 per academic year for residents and $679.55 for nonresidents. The registration for 1952-1953 was 499; graduates 232. The last session began Sept. 29, 1952, and ended July 18, 1953. The next session will begin Sept. 28, 1953, and will end July 17, 1954. The school year of the first three years consists of fall and winter quarters of approximately 11 weeks and a spring quarter of approximately 16 weeks; in the senior year the spring quarter is 11 weeks in length and graduation is in June. The dean of medical sciences is Harold S. Diehl, M.D.

MISSOURI

St. Louis

St. Louis University School of Medicine, 1402 South Grand Boulevard, Zone 4.—Organized in 1901 as the Marion-Sims Beaumont Medical College by union of Marion-Sims Medical College, organized in 1890, and Beaumont Hospital Medical College, organized in 1886. First class graduated in 1902. It became the School of Medicine of St. Louis University in 1903. Completion of three years of college study is the minimum ad-

mission requirement, but students presenting meritorious credits in excess of minimum are accepted by preference. The fees average $896.25 per year. The registration for 1952-1953 was 499; graduates 116. The last session began Sept. 16, 1952, and ended June 1, 1953. The next session will begin Sept. 15, 1953, and will end June 1, 1954. The dean is James W. Colbert Jr., M.D.

Washington University School of Medicine, 660 S. Kingshighway, Zone 10.—Organized in 1842 as the Medical Department of St. Louis University. The first class graduated in 1843. In 1855 it was chartered as an independent institution under the name of St. Louis Medical College. In 1891 it became the Medical Department of Washington University. In 1899 it absorbed the Missouri Medical College. Coeducational since 1918. Three years of college work are required for admission. The fees average $809. The registration for 1952-1953 was 364; graduates 95. The last session began on Sept. 15, 1952, and ended June 10, 1953. The next session will begin on Sept. 14, 1953, and will end on June 9, 1954. The dean is Robert A. Moore, M.D.

NEBRASKA

Omaha

Creighton University School of Medicine, 302 North 14th Street, Zone 2.—Organized in 1892 as the John A. Creighton Medical College. The first class graduated in 1893. Present title in 1921. Coeducational since organization. Three years of collegiate work are required for admission. The tuition fees average $809 per academic year. The registration for 1952-1953 was 298; graduates 76. The last session began Sept. 16, 1952, and ended June 4, 1953. The next session will begin Sept. 14, 1953, and will end June 3, 1954. The dean is F. G. Gillick, M.D.

University of Nebraska College of Medicine, 42nd Street and Dewey Avenue, Zone 5.—Organized in 1881 as the Omaha Medical College. The first class graduated in 1882. It became the Medical Department of Omaha University in 1891. The University of Nebraska College of Medicine was established in Lincoln in 1883, and in 1902 the Omaha Medical College became a part of the University of Nebraska and has continued with the present title College of Medicine, University of Nebraska. The instruction of the first two years was given at Lincoln and of the last two years at Omaha until 1913, when the work of all four years was transferred to Omaha. Coeducational since 1882. Three years of college work are required for admission. The B.S. degree in medicine is conferred at the end of the second year. The fees average $450 per academic year; nonresidents are charged $615. The registration for 1952-1953 was 344; graduates 87. The last session for seniors began June 30, 1952, and ended June 13, 1953. The last session for freshmen, sophomores and juniors began Sept. 24, 1952, and ended June 20, 1953. The present session for seniors began July 6, 1953, and will end June 12, 1954. The next session for freshmen, sophomores and juniors will begin Sept. 23, 1953, and will end June 19, 1954. The dean is James P. Tollman, M.D.

NEW YORK

Albany

Albany Medical College, 47 New Scotland Avenue, Zone 3.—Organized in 1838. The first class graduated in 1839. It became the Medical Department of Union University in 1873. In 1915 Union University assumed educational control. Coeducational since 1915. The requirement for admission is three years of college work. The fees average $825 per academic year. The registration for 1952-1953 was 215; graduates 47. The last session began on Sept. 8, 1952, for freshmen, sophomores and juniors and ended on May 29, 1953, and for the seniors the last session began on June 1, 1952, and ended on May 29, 1953. The present senior class began on June 1, 1953. The next session for the freshmen and sophomores will begin on Sept. 14, 1953, and will end on May 29, 1954. The next session for the juniors will begin on Sept. 8, 1953, and will end on May 22, 1954. The dean is Harold C. Wiggers, Ph.D.

Buffalo

University of Buffalo School of Medicine, 24 High Street.—Organized in 1846. The first class graduated in 1847. It absorbed the Medical Department of Niagara University in 1898. Coeducational since organization. The minimum requirement for admission is four years of collegiate work including certain prescribed science subjects. The fees average $828. The registration for 1952-1953 was 274; graduates 59. The last session began Sept. 22, 1952, and ended June 13, 1953, for freshmen, sophomores and juniors, and began on July 7, 1952, and ended June 6, 1953, for seniors. The next session will begin Sept. 21, 1953, and end June 12, 1954, for freshmen, sophomores and juniors, and will begin Aug. 31, 1953, and end June 5, 1954, for seniors. The dean is Stockton Kimball, M.D.

New York City

Columbia University College of Physicians and Surgeons, 630 West 168th Street, Zone 32.—The medical faculty of Columbia College, then known as King's College, was organized in 1767. Instruction was interrupted by the War of the Revolution. The faculty was reestablished in 1792 and merged in 1814 with the College of Physicians and Surgeons, which had received an independent charter in 1807. In 1860 the College of Physicians and Surgeons became the Medical Department of Columbia College. This merger became permanent by legislative enactment in 1891. Columbia College became Columbia University in 1896. The medical school has been coeducational since 1917. Three years of collegiate work are required for admission. Fees average $900 per academic year. The registration for 1952-1953 was 463; graduates 116. The last session began on June 9, 1952, for juniors and seniors, and ended on May 29, 1953. The last session for freshmen and sophomores began on Sept. 11, 1952, and ended May 29, 1953. The present session began on June 9, 1953, and June 1, 1953, for the juniors and seniors respectively, and will end May 29, 1954, and will begin on Sept. 10, 1953, for the freshmen and sophomores and will end May 29, 1954. The dean is Willard C. Rappleye, M.D.

Cornell University Medical College, 1300 York Avenue, Zone 21.—Organized in 1898. Coeducational since organization. First year teaching was given formerly to approximately one third of the class at Ithaca but in 1938 this division was discontinued and all instruction is now in New York City. All students matriculated must be graduates of approved colleges or scientific schools or seniors *in absentia* who will receive the bachelor degree from their college on successful completion of one or more years of the medical course. The fees average $925 a year. The registration for 1952-1953 was 338; graduates 84. The last session began for senior students June 23, 1952, and ended June 10, 1953. The freshman, sophomore and junior classes began Sept. 11, 1952, and ended June 10, 1953. The present session for seniors began June 22, 1953, and will begin for the remaining three classes on Sept. 10, 1953, and all classes will end June 9, 1954. The acting dean is Dayton J. Edwards, M.D.

New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street.—Organized in 1858. Incorporated in 1860 as the Homeopathic Medical College of the State of New York. The title New York Homeopathic Medical College was assumed in 1869; the title New York Homeopathic Medical College and Hospital in 1887; the title New York Homeopathic Medical College and Flower Hospital in 1908; the title New York Medical College and Flower Hospital in 1936; the present title of New York Medical College, Flower and Fifth Avenue Hospitals, June 22, 1938. First class graduated in 1861. Coeducational since 1919. Three years of college work is the minimum requirement for admission, but a degree is preferred. The fees average $886 per academic year. The registration for 1952-1953 was 493; graduates 121. The last session began Sept. 15, 1952, and ended June 3, 1953. The next session will begin Sept. 14, 1953, for first and second year students. Third year students began June 8, 1953, and fourth year students May 25, 1953. The president is J. A. W. Hetrick, M.D. The executive dean is Ralph E. Snyder, M.D.

New York University College of Medicine, 477 First Avenue, Zone 16.—This is the undergraduate medical college of the New York University–Bellevue Medical Center which comprises also the Post-Graduate Medical School and the University Hospital. The Medical Department of New York University (then called the University of the City of New York) was organized in 1841 as the University Medical College. In 1898 it united with the Bellevue Hospital Medical College, organized in 1861, under the name of University and Bellevue Hospital Medical College. In 1935 the name was changed to New York University College of Medicine. In 1947 the charter of the university and the statutes were amended establishing the New York University–Bellevue Medical Center, which includes the College of Medicine. Coeducational since 1919. Entrance requirements give preference to those who have completed not less than three full years in an approved college of arts and sciences. The fees average $900 per academic session. The registration for 1952-1953 was 529; graduates 127. The last session began Sept. 15, 1952, and ended May 23, 1953, for freshmen, sophomores and seniors, and Sept. 12, 1953, for juniors. The next session begins Sept. 14, 1953, for freshmen, sophomores and juniors, and Sept. 21, 1953, for seniors, and will end May 22, 1954, for freshmen and sophomores, Sept. 11, 1954, for juniors, and May 29, 1954, for seniors. The dean is Currier McEwen, M.D.

State University of New York College of Medicine at New York City, 350 Henry Street, Zone 2.—Originally organized in 1858 as the collegiate department of The Long Island College Hospital. The first class was graduated in 1860 and the last class in 1930. Was chartered in 1930 as Long Island College of Medicine with the first class graduated in 1931 and the last in 1949. It was merged with the State University of New York on April 5, 1950, and the first class under the University was graduated in June 1950. Coeducational. Three years of collegiate work, including specified courses, are required for admission. The fees are $715 per academic year. The registration for 1952-1953 was 590; graduates 140. The last session for seniors began Sept. 8, 1952, and ended May 29, 1953. The last session for juniors began on Sept. 15, 1952, and ended May 29, 1953. The last session for freshmen and sophomores began on Sept. 15, 1952, and ended June 6, 1953. The next session for freshmen, sophomores and juniors begins on Sept. 21, 1953, and will end on June 12, 1954. For seniors the next session will begin Sept. 14, 1953, and will end on June 5, 1954. The dean is Jean A. Curran, M.D.

Rochester

University of Rochester School of Medicine and Dentistry, 260 Crittendon Boulevard, Zone 20.—Organized in 1925 as the Medical Department of the University of Rochester. Coeducational since organization. Three years of collegiate work are required for admission. The fees are $800 per academic year. The registration for 1952-1953 was 275; graduates 64. The last session began Sept. 15, 1952, and ended June 6, 1953. The next session will begin on Sept. 21, 1953, and will end on June 12, 1954. The dean is Donald G. Anderson, M.D.

Syracuse

State University of New York at Syracuse College of Medicine, 766 Irving Avenue, Zone 10.—Organized in 1872, when the Geneva Medical College, chartered in 1834, was removed to Syracuse, under the title "The College of Physicians and Surgeons of Syracuse University." Assumed

title Syracuse University College of Medicine in 1875, when a compulsory three year graded course was established. The College of Medicine was merged with the State University of New York on June 26, 1950, when the present title was assumed. The first class graduated in 1873 and a class graduated each subsequent year. In 1889 the amalgamation with the university was made complete. Course extended to four years in 1896. Coeducational since organization. Three years of collegiate work are required for admission. The fees average $800 per academic year. The registration for 1952-1953 was 278; graduates 61. The last session began Sept. 8, 1952, and ended June 6, 1953. The next session will begin Sept. 14, 1953, and end June 12, 1954. The dean is William R. Willard, M.D.

NORTH CAROLINA

Durham

Duke University School of Medicine.—Organized in 1930. The first class was admitted Oct. 1, 1930. Coeducational. The premedical requirement is three years of college work. The academic year consists of three quarters each year. There is no summer quarter between the first and second year, but in the two clinical years the subjects of the autumn, winter, and spring terms are repeated in the summer quarter. This accelerated schedule is optional, and students may take their first year, and three quarters in each of their subsequent years, and receive their certificates in four calendar years, or if they receive permission from the curriculum committee they may at the end of their second year take the clinical quarters given during the summers and receive their certificates in three and one quarter calendar years. The B.S. degree in medicine may be conferred for special work after six quarters. Students are urged to spend three years in hospital or laboratory work after graduation and must give assurance satisfactory to the executive committee that they will spend at least two years. Active duty with the Army, Navy or Public Health Service can replace the second year. The fees are $900 for three quarters. The registration for 1952-1953 was 315; graduates 85. During 1953 the quarters begin Jan. 5, March 30, July 6, Oct. 5, and end March 21, June 13, Sept. 19, and Dec. 19. The next first year class will be enrolled Oct. 5, 1953, and will end June 12, 1954. The dean is Wilburt C. Davison, M.D.

Winston-Salem

Bowman Gray School of Medicine of Wake Forest College, Zone 7.—Organized in 1902 at Wake Forest as a school offering only the first two years of the curriculum. In 1941 the school was moved to Winston-Salem and expanded to a complete four-year medical school under its present name. Coeducational. Three years of college work are required for admission. Clinical departments operate four quarters in the year; however, the plan of operation makes it possible for students to be out of school during one quarter of each of the clinical years for research, for study elsewhere, or for earning money to help defray expenses for their education. Tuition is $750 per school year. The registration for 1952-1953 was 206; graduates 52. The last session for the freshman class began Oct. 6, 1952; sophomores Oct. 6, 1952; juniors and seniors July 14, 1952, and ended for freshmen, sophomores, juniors, and seniors on June 13, 1953. The present junior and senior classes began July 13, 1953, and will end on June 12, 1954. The next freshmen and sophomore classes will begin Oct. 5, 1953, and will end June 12, 1954. The dean is C. C. Carpenter, M.D.

OHIO

Cincinnati

University of Cincinnati College of Medicine, Eden and Bethesda Avenues, Zone 29.—Organized in 1819 as the Medical College of Ohio. Became the Medical College of the University of Cincinnati in 1896. In 1909 the Miami Medical College (founded in 1852) was merged with the University of Cincinnati's Medical School. Coeducational since organization. Three years of collegiate work are the minimal requirements for admission but a bachelor's degree is strongly recommended. Tuition is as follows: for legal residents of Cincinnati $575 a year plus breakage fees ($125 additional for those not legal residents). The registration for 1952-1953 was 354; graduates 89. The last session for freshmen and sophomores began Sept. 22, 1952, and ended May 30, 1953. The last session for juniors and seniors began Sept. 8, 1952, and ended for juniors June 13, 1953, and for seniors May 30, 1953. The next session for juniors and seniors will begin Sept. 8, 1953, and end for juniors June 12, 1954 and for seniors May 31, 1954. The next session for freshmen and sophomores will begin Sept. 21, 1953, and will end May 31, 1954. The dean is Stanley E. Dorst, M.D.

Cleveland

Western Reserve University School of Medicine, 2109 Adelbert Road, Zone 6.—Organized in 1843 as the Cleveland Medical College in cooperation with Western Reserve College the first class graduated in 1844. The school assumed the present title in 1881. In 1910 the Cleveland College of Physicians and Surgeons was merged. Coeducational since 1919. Students are required to have three years of college work for admission; four years preferred. The fees average $800 per academic year. The registration for 1952-1953 was 324; graduates 78. The last session began Sept. 17, 1952 for freshmen and sophomores, and ended June 6, 1953. For juniors the last session began Sept. 10, 1952, and ended May 29, 1953. For seniors the last session began Aug. 25, 1952, and ended June 10, 1953. The next session for freshmen and sophomores will begin Sept. 23, 1953, and will end June 12, 1954. For juniors the session dates will be Sept. 16, 1953 to June 4, 1954, and for seniors from Aug. 31, 1953, to June 16, 1954. The dean is Joseph T. Wearn, M.D.

Columbus

Ohio State University College of Medicine, Neil and Eleventh Avenues, Zone 10.—The present College of Medicine became a part of The Ohio State University in 1914. It incorporates all the previous medical college interests in central Ohio, standing upon a foundation of six medical schools: The Medical Department of Willoughby University of Lake Erie, 1834-1846; The Willoughby Medical College of Columbus, 1846-1847; The Starling Medical College, 1847-1907; the Columbus Medical College, 1875-1892; The Ohio Medical University, 1892-1907; Starling-Ohio Medical College 1907-1914. Graduates of these colleges by action of the Board of Trustees are considered alumni of The Ohio State University. Coeducational since organization. Three years of collegiate work are required for admission. Tuition fees average $495 per academic year and $225 additional for nonresidents. The registration for 1952-1953 was 516; graduates 84. The last session began Sept. 30, 1952, and ended June 12, 1953. The next session will begin Sept. 29, 1953, and end June 11, 1954. The dean is Charles A. Doan, M.D.

OKLAHOMA

Oklahoma City

University of Oklahoma School of Medicine, 800 North East 13th Street, Zone 4.—Organized in 1900. Until 1910 gave only the first two years of the medical course at Norman, Oklahoma, after which a clinical department was established at Oklahoma City through consolidation with the Medical School of Epworth University. The first class graduated in 1911. Coeducational since organization. A new medical school building and a second teaching hospital became available in 1928, and since September of that year the entire four year course has been given in Oklahoma City. Prerequisites for admission are three years of college work. The fees for residents of Oklahoma are $350; nonresidents $700. The registration for 1952-1953 was 361; graduates 78. The last session began Sept. 15, 1952, and ended June 8, 1953. The next session for freshmen and sophomores will begin Sept. 14, 1953 and will end June 8, 1954. The third year class will begin on Sept. 1, 1953, and end June 8, 1954. The senior session began June 22, 1953, and will end June 8, 1954. The dean is Mark R. Everett, Ph.D.

OREGON

Portland

University of Oregon Medical School, 3181 S. W. Sam Jackson Park Road, Zone 1.—Organized in 1887. The first class graduated in 1888, and a class graduated each subsequent year except 1898. The Willamette University Medical Department was merged in 1913. Coeducational since organization. Entrance requirement is three years of college work. The total fees are $456 a year for residents of Oregon and $180 a year additional for nonresidents, plus a breakage deposit of $15 a year for the first two years. The registration for 1952-1953 was 274; graduates 71. The last session began Sept. 29, 1952, and ended June 13, 1953. The next session will begin Sept. 30, 1953, and will end June 18, 1954. The dean is D. W. E. Baird, M.D.

PENNSYLVANIA

Philadelphia

Hahnemann Medical College and Hospital of Philadelphia, 235 North 15th Street, Zone 2.—Formed by the sucessive union of several institutions. The earliest original charter was obtained in 1848. The name Hahnemann Medical College was taken by one of these institutions in 1867. The present name was assumed in 1885. The first class graduated in 1849. Coeducational since 1941. A minimum of three years of collegiate work in an approved college of arts and sciences is required for admission. Fees for 1953-1954 session are respectively for the first, second, third, and fourth year classes $847, $847, $847 and $877. The registration for 1952-1953 was 385; graduates 83. The last session began for all students Sept. 15, 1952, and ended for the first and second year classes on June 13, 1953; for the third year class June 12, 1953, and for the fourth year class on June 18, 1953. The next session for all classes will begin Sept. 14, 1953, and will end for the first and second year classes June 12, 1954, for the third year class June 11, 1954, and for the fourth year class June 17, 1954. The dean is Charles L. Brown, M.D.

Jefferson Medical College of Philadelphia, 1025 Walnut Street.—Organized in 1825 as the Medical Department of Jefferson College, Canonsburg, Pa. It was chartered with its present title in 1838. Classes have been graduated annually beginning in 1826. In 1838 a separate university charter was granted without change of title, since which time it has continued under the board of trustees. For the class entering in 1953 the minimum entrance requirements will be three years of college work. The tuition fee averages $850 a year. The registration for 1952-1953 was 662; graduates 160. The last session began for all classes on Sept. 8, 1953. Classes ended for freshmen on June 10, 1953, for sophomores on June 18, 1953, for juniors on June 4, 1953, and for seniors on May 29, 1953. Graduation was June 12, 1953. The next session will begin for all classes on September 14, 1953, and will end for freshmen on June 12, 1954, for sophomores on June 26, 1954, for juniors on June 5, 1954, and for seniors on June 18, 1954. The dean is George Allen Bennett, M.D.

Temple University School of Medicine, 3400 North Broad Street, Zone 40. Organized in 1901. The first class graduated in 1904. Coeducational since organization. Three years of collegiate work are required for admission. The fees average $800 per academic year. The registration for 1952-1953 was 508; graduates 122. The last session began Sept. 5, 1952, and ended June 13, 1953, for freshmen, sophomores, and juniors. The senior

class began Aug. 18, 1952, and ended June 18, 1953. The next session will begin Sept. 5, 1953, and will end June 19, 1954. The vice president and dean is William N. Parkinson, M.D.

University of Pennsylvania School of Medicine, Thirty-Sixth and Pine Streets.—Organized in 1765. Classes were graduated in 1768 and in all subsequent years except 1772 and 1775-1779, inclusive. The original title was the Department of Medicine, College of Philadelphia. The present title was adopted in 1909. It granted the first medical diploma issued in America. In 1916, it took over the Medico-Chirurgical College of Philadelphia to develop it as a graduate school. Coeducational since 1914. Three years of collegiate work are required for admission. The tuition fee is $850, with a deposit of $15, a general fee including student health of $70 and a matriculation fee of $5. The registration for 1952-1953 was 511; graduates 129. The last session began Sept. 2, 1952, and ended June 6, 1953. The next session will begin Sept. 8, 1953, and will end June 12, 1954. The dean is John McK. Mitchell, M.D.

Woman's Medical College of Pennsylvania, 3300 Henry Avenue, Zone 29.—Organized in 1850. Classes were graduated in 1852 and in all subsequent years except 1862. At least three years of collegiate work are required for admission and candidates with a degree are given preference. The curriculum covers three years of 36 weeks each and one year of 40 weeks. Total fees are $860 yearly. The registration for 1952-1953 was 183; graduates 46. The last session began Aug. 4, 1952, for fourth year and Sept. 11, 1952, for all other years and ended June 13, 1953. The next session will begin Aug. 10, 1953, for the fourth year and Sept. 14, 1953 for all other classes and will end June 12, 1954. The dean is Marion Fay, Ph.D.

Pittsburgh

University of Pittsburgh School of Medicine, 3941 O'Hara Street.—Organized in 1886, as the Western Pennsylvania Medical College and in 1908 became an integral part of the University of Pittsburgh, removing to the university campus in 1910. The first class graduated in 1887. Coeducational since 1899. Entrance requirements are three years of collegiate work. The total fees are $700 each year. The registration for 1952-1953 was 389; graduates 99. The last session began Sept. 8, 1952, and ended June 10, 1953. The next session will begin on Sept. 14, 1953, and will end June 9, 1954. The dean is William S. McElroy, M.D.

SOUTH CAROLINA

Charleston

Medical College of South Carolina, 16 Lucas Street, Zone 16.— Organized 1823. The first class graduated in 1825. In 1832 a medical college bearing the title Medical College of the State of South Carolina was chartered and the two schools continued as separate institutions until they merged in 1838. Name changed by Act of General Assembly in February 1952 to Medical College of South Carolina. Classes were graduated in all years except 1862 to 1865, inclusive. Coeducational from 1895 to 1912, when privileges for women were withdrawn, being restored in 1917. At least three years of collegiate work are required for admission. The total fees average $432 each year for residents of South Carolina and $1,532 for nonresidents of the state. The registration for 1952-1953 was 260; graduates 57. The last session began on Sept. 25, 1952, and ended June 4, 1953. The next session will begin on Sept. 24, 1953, and will end June 3, 1954. The president is Kenneth M. Lynch, M.D., and the dean is John T. Cuttino, M.D.

TENNESSEE

Memphis

University of Tennessee College of Medicine, 847 Union Avenue, Zone 3.—Organized in 1876, at Nashville as Nashville Medical College. First class graduated in 1877, and a class graduated each subsequent year. Became Medical Department of University of Tennessee in 1879. In 1909 it united with the Medical Department of the University of Nashville to form the joint Medical Department of the Universities of Nashville and Tennessee. This union was dissolved in 1911. The trustees of the University of Nashville by formal action of that board named the University of Tennessee College of Medicine as its legal successor. In 1911 it moved to Memphis, where it united with the College of Physicians and Surgeons. The Memphis Hospital Medical College was merged in 1913, Lincoln Memorial University Medical Department was merged in 1914 Coeducational since 1911. Three years of collegiate work are required for admission. The B.S. degree is conferred on students completing the science-medical curriculum of the University. The fees are $450 for residents and $675 for nonresidents. The registration for 1952-1953 was 713; graduates 155. During the next academic year the quarters begin September, January, March, and July. The vice president and dean is O. W. Hyman, Ph.D.

Nashville

Meharry Medical College, Eighteenth Avenue North and Meharry Boulevard, Zone 8 (For Negro Youth).—Organized in 1876 as the Meharry Medical Department of Central Tennessee College, which became Walden University in 1900. First class graduated in 1877. Obtained new charter independent of Walden University in 1915. Coeducational since 1876. Three years of college work in a school of liberal arts are required for admission. Tuition and fees are: first year $631; second year $621; third year $611; fourth year $626. The curriculum covers four academic years of thirty-four weeks each. In September 1942, Meharry Medical College instituted the quarter system. The registration for 1952-1953 was 260; graduates 60. The last session began on Sept. 29, 1952, and ended on June 8, 1953. The next session begins Sept. 28, 1953, and will end on June 7, 1954. The president is Harold D. West, Ph.D., and the dean is Daniel T. Rolfe, M.D.

Vanderbilt University School of Medicine, Twenty-first Avenue South at Edgehill, Zone 5.—The school was founded in 1874. The first class graduated in 1875. Coeducational since 1925. For matriculation, students must be graduates of collegiate institutions of recognized standing or seniors *in absentia,* who will receive the bachelor degree from their college after having completed sucessfully one year of work in the school of medicine. The course covers four academic years, two of nine months each and two of ten months each. The fees average $810 per academic year. The registration for 1952-1953 was 206; graduates 51. The last session began Sept. 22, 1952, and ended June 7, 1953. The next session will begin Sept. 28, 1953, and will end June 6, 1954. The dean is John B. Youmans, M.D.

TEXAS

Dallas

Southwestern Medical School of The University of Texas, 2211 Oak Lawn.—Organized in 1943. The first class graduated March 20, 1944. Coeducational since organization. Became a branch of the University of Texas, Sept. 1, 1949. The medical school is operated on the regular program offering three terms of twelve weeks each per academic year. The tuition fees for residents average $125 per year. The nonresident fee is $375 per year. Three years of college work are required for admission. The registration for 1952-1953 was 399; graduates 98. The last session began Sept. 8, 1952, and ended June 1, 1953. The next session will begin Sept. 9, 1953 and will end June 9, 1954. The dean is George N. Aagaard, M.D.

Galveston

University of Texas School of Medicine, 900 Strand.—Organized in 1890. The first class graduated in 1892. Coeducational since organization. Three years of collegiate training are required for admission. The fees average $97 per academic year, including health fees for medical care and hospitalization. The registration for 1952-1953 was 595; graduates 138. The last session began on Sept. 16, 1952 for freshmen, Sept. 22, 1952, for sophomores, and July 7, 1952, for seniors, all classes ended June 6, 1953. The next freshman class will matriculate Sept. 15, 1953, and the sophomore and junior classes will matriculate on Sept. 21, 1953, the seniors matriculated July 6, 1953, all classes will end June 5, 1954. The director is Chauncey D. Leake, Ph.D., and D. Bailey Calvin, Ph.D. is dean of student and curricular affairs.

Houston

Baylor University College of Medicine, Texas Medical Center.—Organized in 1900 at Dallas as the University of Dallas Medical Department. In 1903 it took its present name and became the Medical Department of Baylor University. It acquired the charter of Dallas Medical College in 1904. The school was moved to Houston in 1943. Coeducational since organization. The first class graduated in 1903. Entrance requirements are three years of collegiate work. The course covers four years of eight months each. The fees are respectively $775, $765, $750, $775. The registration for 1952-1953 was 365; graduates 88. The last session began Sept. 29, 1952, and ended June 8, 1953. The next session will begin Sept. 14, 1953, and will end May 31, 1954. The dean is Stanley W. Olson, M.D.

UTAH

Salt Lake City

University of Utah College of Medicine.—Organized in 1905. Coeducational since organization. Four year curriculum established, March 1943. Three years of collegiate work are required for admission. The next freshman class will be admitted in September 1953. All subsequent freshmen classes will begin in September of each year. Classes are scheduled during three academic quarters (12 weeks) each calendar year. Applications for admission (complete) must be submitted prior to October 31 preceding opening date. The fees for each quarter average $480 (resident), and $830 (non-resident). The registration for 1952-1953 was 181 and graduates 28. The next session for freshmen, sophomores and juniors will be in September 1953, and end in June 1954. The next session for seniors will begin in September 1954, and end in June 1955. The present session for seniors began in March 1953, and will end in March 1954. The dean is John Z. Bowers, M.D.

VERMONT

Burlington

University of Vermont College of Medicine, Pearl Street, College Park. —Organized with complete course in 1822. Classes graduated in 1823 to 1836, inclusive, when the school was suspended. It was reorganized in 1853 and classes were graduated in 1854 and in all subsequent years. Coeducational since 1920. Three years of college work are required for admission. For residents of Vermont the tuition fee averages $567 per session. Nonresidents are charged an additional $250 each session. A $25 fee is charged for the doctor's degree. Registration for 1952-1953 was 184; graduates 42. The last session for freshmen, sophomores and juniors began Sept. 12, 1952, and ended June 14, 1953. The last senior class began June 27, 1952 and graduated June 14, 1953. The present senior class began June 29, 1953; the next freshman, sophomore and junior classes will begin Sept. 11, 1953, and all classes will end June 13, 1954. The dean is George A. Wolf, M.D.

VIRGINIA

Charlottesville

University of Virginia School of Medicine, University Station.—Organized in 1827. Classes were graduated in 1828 and in all subsequent years except 1865. Coeducational since the session of 1920-1921. Three years of college work are required for admission. For residents of Virginia the tuition and other required fees are $465 per academic year; for nonresidents, $865. The registration for 1952-1953 was 286; graduates 70. The last session began Sept. 19, 1952, and ended June 15, 1953. The next session will begin Sept. 18, 1953, and will end June 14, 1954. The dean is Thomas H. Hunter, M.D.

Richmond

Medical College of Virginia, Twelfth and Broad Streets.—Organized in 1838 as the Medical Department of Hampden-Sydney College. Present title was taken in 1854. In 1913 the University College of Medicine was merged. Coeducational since 1918. Classes were graduated in 1838 and in all subsequent years. Three years of collegiate work, as a minimum, are required for admission. Preference, however, is given to applicants with a baccalaureate degree. Fees average $560 per academic year. Nonresidents are charged an additional $275 each year. The registration for 1952-1953 was 366; graduates 100. The last session began Sept. 10, 1952, for second, third and fourth year classes and ended June 2, 1953. The last session for the first year class began Sept. 8, 1952, and ended June 2, 1953. The subsequent session will begin Sept. 10, 1953, for the first year class and Sept. 14, 1953, for the second, third and fourth year classes and will end June 1, 1954. The dean is John B. Truslow, M.D.

WASHINGTON

Seattle

University of Washington School of Medicine, Seattle 5.—Established by the Legislature in 1945 and organized as one of the professional schools in the Division of Health Sciences of the University of Washington in 1946. The first class graduated in 1950. Coeducational. The minimum requirement for admission is three years of collegiate work. Tuition fees are $390 each year for residents of Washington and Alaska and $585 for nonresidents of these areas. Registration for 1952-1953 was 284; graduates 72. The first three classes were limited to 50 students but with the class entering in 1949 this number was raised to 75. The last session began Sept. 22, 1952, and ended June 13, 1953. The next session will begin Sept. 21, 1953, and will end June 12, 1954. The acting dean is James W. Haviland, M.D.

WISCONSIN

Madison

University of Wisconsin Medical School, 418 N. Randall Avenue.—Organized 1907. Gave only the first two years of the medical course until 1925, when the clinical years were added. Coeducational since organization. The entrance requirement is three years of collegiate work. Fees for the first, second and third years $340, for the fourth year $250 per academic year for residents. An additional fee for $320 per year is charged nonresidents. Registration for 1952-1953 was 322; graduates 76. The last session for freshman, sophomore and junior students began Sept. 22, 1952, and ended June 15, 1953. The last senior class began June 30, 1952, and ended June 19, 1953. The next freshman, sophomore and junior classes will begin Sept. 21, 1953, and will end June 14, 1954. The senior class began June 29, 1953, and will end June 18, 1954. The dean is William S. Middleton, M.D.

Milwaukee

Marquette University School of Medicine, 561 North Fifteenth Street, Zone 3.—Organized in December 1912 by the merger of the Milwaukee Medical College and the Wisconsin College of Physicians and Surgeons. Coeducational since organization. Three years of collegiate work are required for admission. The fees are $850 per academic year. The registration for 1952-1953 session was 390; graduates 92. The last session began Sept. 15, 1952, and ended June 5, 1953. The last senior class began June 9, 1952, and ended June 6, 1953. The next session for freshman, sophomore, and junior students will begin Sept. 14, 1953, and will end June 4, 1954. The 1953-1954 session for seniors began on June 8, 1953, and will end June 5, 1954. The dean is John S. Hirschboeck, M.D.

APPROVED MEDICAL SCHOOLS IN CANADA

ALBERTA

University of Alberta Faculty of Medicine, Edmonton.—Organized in 1913. Coeducational since organization. Has given complete medical course since 1924. Tuition for the first and second years is $425 per session, and for the third and fourth years is $450 per session. The registration for 1952-1953 was 231; graduates 52. The last session began Sept. 2, 1952, and ended April 30, 1953. The next regular session will begin Sept. 1, 1953, and end April 30, 1954. The dean is John W. Scott, M.D.

MANITOBA

University of Manitoba Faculty of Medicine, Bannatyne Avenue, Winnipeg.—Organized in 1883 as Manitoba Medical College. First class graduated in 1886, and a class graduated each subsequent year. The college transferred all its property to the University of Manitoba in 1919 and assumed the present title. Coeducational since organization. Matriculation requirements include three years of collegiate work in the faculty of arts and sciences of a recognized university. The course extends over four years of eight months each and a hospital internship. The fees average $438 yearly. The registration for 1952-1953 was 273; graduates 72. The last session began Sept. 8, 1952, and ended on May 15, 1953. The next session will begin on Sept. 14, 1953, and will end on May 22, 1954. The dean is Lennox G. Bell, M.D.

NOVA SCOTIA

Dalhousie University Faculty of Medicine, Morris Street, Halifax.—Organized in 1867. Incorporated as the Halifax Medical College in 1875. Reorganized as an examining faculty, separate from the Halifax Medical College, in 1885. In 1911, in accordance with an agreement between the Governors of Dalhousie University and the Corporation of the Halifax Medical College, the work of the latter institution was discontinued and a full teaching faculty was established by the university. First class graduated in 1872. Coeducational since 1871. Requires for matriculation two years of arts. The regular medical course covers four years and a hospital internship of one year approved by the medical faculty. The fees average $415 yearly; nonresidents $250 additional fee. The last session for freshmen, sophomores and juniors began Sept. 2, 1952, and for seniors May 5, 1952; all classes ended May 12, 1953. The registration for 1952-1953 was 216; graduates 56. The next session for all classes will begin Sept. 7, 1953 and will end May 11, 1954. The dean is H. G. Grant, M.D.

ONTARIO

Queen's University Faculty of Medicine, Kingston.—Organized in 1854. First class graduated in 1855 and a class graduated each subsequent year. The course consists of six sessions of 32 teaching weeks, the sixth session being devoted entirely to clinical work in the hospitals affiliated with the University. The latter is not considered an internship. Fees for each of six years amount to $420.50. The degrees awarded are M.D., C.M. Freshman will be admitted annually. Registration for 1952-1953 was 362; graduates 57. The last session began Sept. 15, 1952 and ended May 13, 1953. The next session will begin Sept. 14, 1953, and will end May 12, 1954. The last convocation was held June 6, 1953. The dean is G. Harold Ettinger, M.D.

University of Ottawa Faculty of Medicine, Ottawa.—Organized in September, 1945. The degree of M.D. is conferred after 1 year premedical studies, 4 years medicine and 1 year of internship. The minimum academic requirements for admission to the premedical year are the Ontario grade 13 honour matriculation, or equivalent certificates. Students who have obtained their bachelor degree in arts or in science and who have completed the required courses in biology, chemistry, and physics may be admitted to the first year of medicine. The registration for 1952-1953 in the medical and premedical years was 251. The next session for the premedical year will begin on Sept. 10, 1953, and for first, second, third, and fourth medical years, on Sept. 8, 1953. Internship is from May 1 to May 1. The session for the premedical year will end in May, 1954, for first, second, and third medical years in June, 1954, and the fourth medical year in April, 1954. Students graduate in the first week of June. The dean is A. L. Richard, M.D.

University of Western Ontario Faculty of Medicine, 346 South Street, London.—Organized in 1881 as the Western University Faculty of Medicine. First class graduated in 1883 and a class graduated each subsequent year. Present title in 1923. The Faculty of Medicine has been under the control of the Board of Governors of the University of Western Ontario since 1913. Coeducational since 1913. The normal course of study covers two honor college years of nine months each and four years of nine months each in the Faculty of Medicine. The total fees to residents of Canada for the last four years are $550 a year. The registration for 1952-1953 was 238; graduates 61. The last session began Sept. 8, 1952, and ended May 20, 1953. The next session begins Sept. 14, 1953, and ends May 26, 1954. The dean is J. B. Collip, M.D.

University of Toronto Faculty of Medicine, Toronto 5.—Organized in 1843 as the Medical Faculty of King's College. Abolished in 1853. Reestablished in 1887. In 1902 it absorbed Victoria University Medical Department and in 1903 it absorbed the Medical Faculty of Trinity University. Coeducational since 1903. The degree of M.D. is conferred after 4 years in the study of medicine. Admission to the medical course is gained following honour matriculation and after two years in the study of premedical requisites in the University of Toronto. A certain number are admitted each year to the first medical year who hold arts degrees from recognized universities and who have covered the necessary work in the humanities and sciences. The B.Sc. (Med.) degree may be conferred for special work or investigation as a graduate degree, or under certain circumstances for an extra year's work as an undergraduate. The registration for 1952-1953 in the medical and premedical years was 883; graduates 162. The next session for first and second premedical years will begin on Sept. 23, 1953 and for first, second, third and fourth medical years on Sept. 21, 1953. The session for premedical years will end on May 1, 1954, and for medical years on May 15, 1954. Students will graduate annually in June. The dean is J. A. MacFarlane, M.B.

QUEBEC

McGill University Faculty of Medicine, 3640 University Street, Montreal.—Founded in 1823 as Montreal Medical Institution; became the Medical Faculty of McGill University in 1829; first class graduated under the university auspices in 1833. No session between 1836-1839, owing to political troubles. In 1905 it absorbed the Faculty of Medicine of the University of Bishop's College. Coeducational since 1917. Three years of collegiate work are required for admission. The total fees for each of the four medical years are $593. The registration for 1952-1953 was 442; graduates 115. The last session began Sept. 3, 1952, and ended May 30, 1953, for the first three classes and May 2, 1953, for the senior class. The next session will begin Sept. 9, 1953, and will end June 5, 1954, for the first three classes and May 1, 1954, for the seniors. The dean is G. Lyman Duff, M.D.

University of Montreal Faculty of Medicine, 2900 Mount Royal Boulevard, Montreal.—Organized in 1843 as the Montreal School of Medicine and Surgery. In 1891, by Act of Parliament, was merged with the Faculty of Medicine of Laval University at Montreal (organized in 1878). Present name by Act of Parliament in 1920. A class was graduated in 1843 and each subsequent year. Coeducational since 1925. The requirements for admission are: B.A. degree or its equivalent, with a supplementary year in the Faculty of Pure Science or an entrance examination on the premedical subjects. An internship is required for graduation. The fees are $390 yearly for residents, and $465 yearly for nonresidents. The registration for 1952-1953 was 414; graduates 89. The last session began Sept. 9, 1952, and ended May 22, 1953. The next session will begin Sept. 10, 1953, and will end May 23, 1954. The dean is Wilbrod Bonin, M.D.

Laval University Faculty of Medicine, Quebec.—The Quebec School of Medicine, organized in 1848, became in 1852 the Laval University Faculty of Medicine; first class graduated in 1855, and a class graduated each subsequent year. The premedical requirement is a B.A. degree. The medical course is six years in length, lincluding a one year internship in affiliated teaching hospitals. The first year (premedical) may be avoided by a special examination. The fees for each of the medical years average $400 for residents of Canada. Nonresidents are charged an extra fee of $200 each year. The registration for 1952-1953 was 603; graduates 108. The last session began Sept. 15, 1952, and ended June 1, 1953. The next session will begin Sept. 14, 1953, and will end June 5, 1954. The dean is Charles Vézina, M.D.

APPROVED SCHOOLS OF THE BASIC MEDICAL SCIENCES IN THE UNITED STATES

MISSISSIPPI

University

University of Mississippi School of Medicine.—Organized in 1903. Coeducational since organization. A clinical department was established at Vicksburg in 1908 but was discontinued in 1910 after graduating one class. Entrance requirement is three years of collegiate work. Fees average $410 50 annually. There is a nonresident additional fee of $200. The school operates on an accelerated program by accepting two freshman classes each session. Registration for 1952-1953 was 109. The last session for freshmen began July 14, 1952, and ended May 2, 1953. An additional freshman class was admitted Jan. 5, 1953, and will end Oct. 10, 1953. The sophomore session began May 26, 1952, and ended Jan. 31, 1953. An additional sophomore session began Oct. 27, 1952, and ended July 3, 1953. The dean is David S. Pankratz, M.D.

MISSOURI

Columbia

University of Missouri School of Medicine.—Organized at St. Louis in 1845; was discontinued in 1855 but was reorganized at Columbia in 1872. Teaching of the clinical years was suspended in 1909. Coeducational since 1872. The entrance requirement is three years of collegiate work. The B.S. degree in medicine is conferred at the end of the second year. Total fees for the first year are $249, for the second year $235. The registration for 1952-1953 was 83. The last session began Sept. 11, 1952, and ended June 7, 1953. The next session will begin Sept. 15, 1953, and will end June 12, 1954. The dean is Roscoe L. Pullen, M.D.

NEW HAMPSHIRE

Hanover

Dartmouth Medical School.—Organized by Dr. Nathan Smith in 1797. The first class graduated in 1798. It is under the control of the Trustees of Dartmouth College. Courses of the third and fourth years were discontinued in 1914. Three years of college work and candidacy for the bachelor's degree are required for admission. Candidates for the A.B. degree in Dartmouth College may substitute the work or the first year in medicine for that of the senior year. The tuition is $800 for each year. The registration for 1952-1953 was 48. The last session began on Sept. 21, 1952, and ended June 14, 1953. The next session will begin Sept. 20, 1953, and will end June 13, 1954. The dean is Rolf C. Syvertsen, M.D.

NORTH CAROLINA

Chapel Hill

University of North Carolina School of Medicine.—Organized in 1890. Until 1902 this school gave only the work of the first two years, when the course was extended to four years by the establishment of a department in Raleigh. The first class was graduated in 1903. A class was graduated each subsequent year, including 1910, when the clinical department at Raleigh was discontinued. Coeducational since 1914. Three years of college work are normally required for admission. The tuition is $600 per year for residents; for nonresidents an additional $600 per year. The registration for 1952-1953 was 167. The North Carolina legislature in 1947 appropriated funds for the expansion of the school to the full four years. The first senior class will graduate June 7, 1954. The last regular session began Sept. 22, 1952, and ended June 8, 1953. The next session will begin Sept. 18, 1953, and will end June 7, 1954. The dean is W. Reece Berryhill, M.D.

NORTH DAKOTA

Grand Forks

University of North Dakota School of Medicine.—Organized in 1905. Offers only the first two years of the medical course. Coeducational since organization. Three years work in a college of liberal arts are required for admission. The B.S. degree in combined arts-medical course is conferred at the end of the second year. The fees are $126.50 each year for resident students and $206.50 for nonresidents. The registration for 1952-1953 was 72. The last session began Sept. 15, 1952, and ended June 9, 1953. The next session will begin Sept. 18, 1953, and will end June 5, 1954. The dean is Theo. H. Harwood, M.D.

SOUTH DAKOTA

Vermillion

University of South Dakota School of Medical Sciences.—Organized in 1907 as the University of South Dakota School of Medicine. Present title in 1937. Coeducational since organization. Offers only the first two years of the medical course. Three years work in a college of liberal arts are required for admission. Students who complete the third year of premedical work in the College of Arts and Sciences at the University of South Dakota may apply the work of the first year of medicine to an A.B. degree: The B.S. degree is conferred at the end of the second year on those students who do not hold a combination (Arts and Sciences and Medicine Course) A.B. degree. The tuition is $270 for the first year residents and $360 for second year residents; $480 for first year nonresidents, and $570 for second year nonresidents. Registration for 1952-1953 was 63. The last session began Sept. 1, 1952, and ended June 4, 1953. The next session for first and second year students will commence Sept. 1, 1953, and will end June 5, 1954, for first year students and will end June 30, 1954, for second year students. Following the didactic work in the second year, the sophomores spend a three week period of clerkship at the three Sioux Falls hospitals. After this they are assigned to a physician in general practice in the state for a three-week preceptorship program. The dean is W. L. Hard, Ph.D.

WEST VIRGINIA

Morgantown

West Virginia University School of Medicine.—Organized in 1912. Gives the first two years of the medical course, but agreement has been made for the transfer of 25 students each year to the Medical College of Virginia. Coeducational since organization. Entrance requirements are three years of collegiate work. The B.S. degree is conferred at the end of the second year. Fees for residents of the state are, respectively, $258 and $268; nonresidents, $442 additional each year. The registration for 1952-1953 was 60. The last session began Sept. 15, 1952, and ended June 1, 1953. The next session will begin Sept. 14, 1953, and will end May 31, 1954. The dean is Edward J. Van Liere, M.D.

APPROVED SCHOOL OF THE BASIC MEDICAL SCIENCES IN CANADA

SASKATCHEWAN

University of Saskatchewan School of Medical Sciences, Saskatoon.—Organized in 1926. Coeducational. Offers the first two years of the medical course. Two years of university premedical work is required for admission. The B.A. degree is conferred at the end of the second year. The fees are $380. The registration for 1952-1953 was 61. The last session for freshmen began Sept. 24, 1952, and ended June 17, 1953. The next session will begin Sept. 23, 1953, and will end June 9, 1954. The dean is J. Wendell Macleod, M.D.

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FIFTY-THIRD ANNUAL REPORT ON MEDICAL EDUCATION

In this issue of THE JOURNAL is the 53rd Annual Report on Medical Education in the United States and Canada prepared by the Council on Medical Education and Hospitals as a public service. Among the most important and interesting events of the past year are those that reflect the critical reevaluation to which the whole of medical education has been subjected since the end of the war. A considerable number of innovations made last year by the schools and plans for revision of programs are listed in this report. The one certain to attract the most attention is the experimental program of undergraduate medical education inaugurated at Western Reserve University, where the traditional departmental approach to teaching has been abandoned and the entire curriculum organized on the basis of multidisciplined, correlative teaching. A brief outline of this experimental program is contained in this report, and a fuller discussion of its present development will be found in the Proceedings of the Annual Congress on Medical Education and Licensure.

The wide and intense interest in improving medical education was also reflected in the First World Conference on Medical Education, which was held in London, England, in August. Men from all parts of the world met at this conference to pool their experiences and to discuss major educational problems of importance in medicine.

The most urgent problem, one which has faced the medical schools ever since the end of World War II, is the financial one. Although large sums have been expended for the development of facilities and for seven consecutive years budgets of the schools have steadily increased, there remains an urgent need for additional funds. The increases in available funds have not been distributed uniformly among the schools, and many schools are in need of capital funds for the improvement and expansion of their facilities, especially those for the basic medical sciences. Increases in operating budgets have been offset in some measure by increases in costs and in the educational and service responsibilities of the schools.

In an effort to estimate the financial needs of the schools for operating funds, the Council on Medical Education and Hospitals and the Association of American Medical Colleges have instituted an intensive study of the problem. It is hoped that the results of this study will be available late this year or early in 1954. Recent information on the cost of attending medical school, as might be expected, shows there has been a definite increase in cost since similar data were collected three years ago. The average cost of attending medical school this year was $2,000 as compared with $1,800 three years ago.

This year for the first time, the schools were requested to furnish data on the total amounts of scholarship and loan funds that are available to their undergraduate medical students. There was great variation in the sums available for these purposes. While some schools are fortunate in having access to rather large funds, the average amount available for scholarships was only $12,014 and the average for loan funds was $41,201. The smallest scholarship fund reported was $300, and the smallest loan fund was $500. It is apparent that a certain number of schools can offer little assistance to students needing financial help. In fact the small amounts of funds make it appear that in some instances no vigorous effort has been made to obtain money for these purposes.

The 1952 freshman class and the expected freshman class for 1953 are both slightly smaller than the record class of 1951. This leveling off after a long period of marked and progressive growth in the size of entering classes is interpreted as a readjustment by the schools to near capacity operation. When expansion programs now under way are completed and when new medical schools now in the final stages of development are in full operation, there will be further increases in the size of the entering class. Total student enrollments will continue to advance, since the entering class, although somewhat smaller than that of the previous year, was still larger than the graduating senior class.

Special attention is directed to the fact that, for the second year, the number of graduate students and physicians enrolled in courses leading to graduate degrees in the basic medical sciences has decreased. There has been a total decrease, for the two year period, of 27%. The decline in the ranks of potential teachers in these vital areas, where teachers are already in short supply, is a matter of grave concern, for, unless the supply of basic science teachers can be increased, it will not be possible to continue to expand facilities for training physicians and the quality of existing programs is certain to suffer. This situation helps to highlight the financial problem of the medical schools. For, while it is conceded that salaries in basic science departments are in many instances higher than salaries of similar ranks in other university departments, they still are not high enough to compete successfully with the opportunities available in clinical medicine, in industry, and in certain other professional fields.

It is obviously impossible to predict what demands national defense will make on medical education in the near future. The present truce in Korea may result in some reduction or delay in calling up of physicians under the amended "Doctor-Draft" law of 1953. However, the long-term needs of national defense are such that, for the forseeable future, virtually all medical students deferred from military service for the purpose of completing their medical education should expect, on completion of their internships, to serve with the armed forces.

FINAL REPORT OF SURVEY OF MEDICAL EDUCATION

"Medical Education in the United States at Mid-Century," the final report of the Survey of Medical Education, is now available in book form.[1] This volume will be of the greatest interest not only to those directly involved in medical education but also to practicing physicians who are frequently called on to interpret medical education and the problems of medical schools to the citizens of their communities.

The survey was organized in 1947 by the Council on Medical Education and Hospitals and the Association of American Medical Colleges. Its purpose was to evaluate critically the present programs of the medical schools, to determine the degree of success with which they are meeting their social and educational responsibilities, and to assess, in their broad aspects, the future responsibilities of medical education.

The attainment of these objectives has been a tremendous task, requiring detailed and comprehensive study of all aspects of the activities of medical schools. Data on which the report is based were obtained from an intensive first-hand study of 41 representative schools by the survey staff, from questionnaires sent to all of the medical schools in the United States, and from information accumulated over a period of many years by the Council on Medical Education and Hospitals and the Association of American Medical Colleges.

The report covers the function of the medical schools in education, research and service, finances, administrative organization policies and practices, curriculum and teaching methods, and advanced education, including internship and residency training, graduate training in the basic medical sciences, and postgraduate training. These programs are critically analyzed and recommendations made for their improvement.

Among the significant contributions of the report is its portrayal of the multiplicity and complexity of the responsibilities that are borne by a modern medical school. The rapid evolution of modern science and its application to medicine, together with the sweeping changes that have occurred in recent decades in the social milieu, have profoundly affected the teaching of medical science and its applications. These changes have created, for medical education, unprecedented problems for which there is no easy solution. The rapid expansion of research programs, particularly in the past 15 years, and the service obligations in which medical schools have become involved have placed strains on their finances that have impaired and even jeopardized the basic undergraduate educational programs. The report makes evident the need for clear definition and delineation of the scope of activities that should be undertaken by the medical schools and indicates methods by which the schools may improve their situation.

The enormous expansion in scientific knowledge, much of it revolutionary in character, and the attempt to incorporate large amounts of this material in the traditional pattern of medical education has distorted and overburdened the curriculum. There is a great need for new thinking in this area and for extensive revision of the curriculum. It is also apparent that, if the schools are to be successful in producing physicians competent to apply modern medical science and to advance it, premedical training must be improved and better methods for selection of students to be admitted to medical school must be developed.

The Flexner Report on medical education in the United States, published in 1910, had a revolutionary impact on American medical education. This report, together with the ferment that it stimulated, resulted in the elimination of the proprietary medical schools and the establishment of medical schools on a true university basis. Much critical thinking and hard work have been done by medical faculties in the ensuing years in the development of their programs. Despite the serious problems that now face the schools, the situation is in no way comparable to that of half a century ago, and it can hardly be expected that the present report will result in changes as great as those following the Flexner Report. Nevertheless, the problems now facing the schools call for extensive modification of the programs of the medical schools, and the schools will be assisted tremendously in this undertaking by the critical analyses and the recommendations offered in the report of the survey.

1. Deltrick, J. E., and Berson, R. C.: Medical Schools in the United States at Mid-Century, New York, McGraw-Hill Book Company, 1953.

PRIVATE PATIENTS IN MEDICAL TEACHING

A major problem in medical education today is the extent to which private patients can be utilized in the education of medical students, interns, and residents and the best methods of developing teaching programs centered entirely or largely around private patients. A related problem of tremendous interest and importance to many hospitals with few or no service beds is how such hospitals can develop teaching programs that will enable them to compete successfully for competent interns and residents with hospitals maintaining large public wards.

A stimulating analysis and discussion of this important problem is presented in the article "Private Beds in Medical Teaching" by S. Howard Armstrong Jr., which appears in this issue of THE JOURNAL. Armstrong maintains that, provided certain criteria are met, teaching can be carried out successfully with private patients at all levels except possibly with that of the senior residency. These criteria may be summarized as follows: The patients must present the range of serious disease that physicians will encounter later in their careers. Opportunity must be available for students and house staff to follow the course of patients after discharge from the hospital. The members of the staff must be devoted to teaching and willing to make the sacrifice of time and effort that good teaching requires. The attending physicians must be sufficiently secure in their relationships to their patients to share responsibility with junior colleagues. Finally, the attending staff must be sensitive to the difference between mere training and true education.

It is pointed out that the most difficult problems in utilizing private patients involve not the patient but the relationship of physicians to each other. The nature of these problems are analyzed at length in the paper, and examples of their successful solution are cited.

This discussion is notable for its realistic understanding of the problems facing student, intern, resident, full-

time teacher, the practicing physician and the patient in the organization of an effective educational program centered around private patients. The prerogatives and interests of the practicing physician in his relationship to his private patients are respected at the same time that his responsibilities to the students, interns, and residents assigned to him are emphasized. The desirability of giving the intern and resident increasing responsibility is balanced against their capacity to assume such responsibility and the welfare and rights of the patient.

No ready-made answer to the whole problem of how private patients may best be utilized is advanced, and the author frankly raises questions to which he does not have the answers. The report was prepared for the practicing physician who wants background information on modern processes and standards of clinical education to strengthen teaching in his own hospital. A careful study of this report by hospital staffs should aid them significantly in an evaluation of the effectiveness and attractiveness of their own teaching programs.

FILTRABLE AGENT CAUSING MOUSE SALIVARY GLAND CARCINOMA

Gross [1] of the Veterans Administration Hospital, Bronx, New York, has recently demonstrated that leukemia developing "spontaneously" in mice of the Ak inbred line is actually caused by a filtrable agent, transmitted directly through the embryo.[2] The presence of the agent in extracts prepared from leukemic organs of Ak mice was demonstrated by a bioassay consisting of the injection of such extracts into mice of the C3H line, known to have been essentially free from spontaneous leukemia. The use of newborn animals for inoculation of the extracts proved to be essential in this work, since it soon became evident that the susceptibility of the mouse to experimental infection with the leukemic agent is for all practical purposes limited to the first few hours after birth. After successful inoculation with the leukemic extracts, the mice that had received the injections remained, at first, in good health, but "spontaneous" leukemia developed after they reached middle age, i. e., after a latency of at least several months, and in some instances after an interval exceeding a year or a year and a half.

When, in more recent experiments, Gross [3] passed the Ak leukemic extracts through porcelain filter candles (Selas), having a very fine porosity (O3), and injected the resulting filtrate into newborn C3H mice, the results were surprising: while 9 of the 84 inoculated animals died from typical leukemia, in 15 others bilateral salivary gland carcinomas developed, unexpectedly, instead of leukemia, arising in multiple foci in the parotid glands. In some of these mice metastatic carcinomas developed in the axillary and inguinal pits. There was, however, in these 15 animals, no general involvement of the lymph nodes, no infiltration of liver, spleen, or other organs, and no pathological changes in either the bone marrow or the peripheral blood picture. The average age of mice in which the salivary gland carcinomas developed was 3.3 months, far below that at which spontaneous leukemia usually develops.

Although salivary gland tumors have been observed, on very rare occasions, to develop spontaneously in old mice of certain inbred strains, such as strain C or A, they have not been recorded in either mice of the C3H line (serving as test animals for inoculations), or those of the Ak line; yet mice of the Ak line served as donors of the leukemic organs for which extracts had been prepared for inoculation of the C3H mice. It is conceivable, therefore, that mice of the Ak line carry two different oncogenic agents. One of these agents would be potentially capable of causing the development of leukemia and the other that of salivary gland carcinomas. Since salivary gland tumors do not develop spontaneously in mice of the Ak line, whereas leukemia is common in these animals, it would follow either that mice of the Ak line are not susceptible to the pathogenic action of the salivary tumor agent or that an interference phenomenon may be responsible for the apparent suppression of the pathogenic potentiality of the salivary gland tumor agent by the simultaneous presence of the leukemic agent. In any event, both agents could be experimentally extracted from leukemic organs of Ak mice. They could be separated by ultracentrifugation at 144,000 × g, the carcinoma agent remaining mainly in the supernate, or by passing the extracts through filter candles of very fine porosity, apparently retaining at least some of the leukemic agent, but passing freely the smaller salivary gland tumor agent. It also appears that the salivary gland tumor agent is slightly more resistant to high temperature than the leukemic agent, heating to 68 C and 65 C for 30 minutes, respectively, being required for inactivation. Both agents were found in normal, healthy Ak embryos, suggesting thereby that both are being transmitted, in mice of the Ak line, from one generation to another.

The implications of these findings for human pathology could be of considerable interest. Should leukemia be caused by a transmissible agent not only in chickens and mice but also in man, the possibility would have to be considered that in man also the leukemic agent may be accompanied by another oncogenic agent, potentially capable of causing some forms of sarcoma or carcinoma. As in mice, in man also such oncogenic agents could be transmitted, in their inactive form, coupled together and not causing any symptoms, from one generation to another. An interference phenomenon might be responsible for the apparent latency of either, or both, agents in most of the carrier-hosts. Occasionally, however, prompted perhaps by an accidental segregation of such agents, an activation of either agent may now and then occur, resulting in the development of leukemia in some, and carcinoma or sarcoma in other members of the same family tree. This hypothesis [3] may explain clinical observations suggesting that in families of patients with leukemia, malignant tumors, such as carcinoma or sarcoma, are commoner than in the average population.

In any event, the discovery of another malignant tumor caused by a filtrable, thermolabile, and transmissible agent adds one more tumor to the impressively growing list of virus-caused neoplasms.

1. Gross, L.: Biological Properties of Mouse Leukemia Agent, Cancer 6: 153-158 (Jan.) 1953.
2. Transmissible Leukemia in Mice, editorial, J. A. M. A. 148: 746 (March 1) 1952.
3. Gross, L.: Filterable Agent, Recovered from Ak Leukemic Extracts, Causing Salivary Gland Carcinomas in C3H Mice, Proc. Soc. Exper. Biol. & Med. 83: 414-421 (June) 1953.

ORGANIZATION SECTION

STATEMENT BEFORE HOUSE COMMITTEE ON RETIREMENT FUNDS FOR SELF-EMPLOYED PERSONS

Gentlemen: I am Dr. Edward J. McCormick of Toledo, Ohio, where I am engaged in the active practice of medicine. I am President and a member of the Board of Trustees of the American Medical Association. I am appearing here today as a representative of that Association relative to measures currently pending before your Committee which are designed to provide retirement funds for self-employed persons and others not covered by existing pension plans. With me is Frank G. Dickinson, Ph.D., Director of the Bureau of Medical Economic Research of the Association. At the conclusion of my brief statement I should like to have Dr. Dickinson discuss the technical details of the proposals under consideration.

At the outset I would like to state that the American Medical Association has, for a number of years, endorsed the principle of legislation of this type. In the early part of 1948 there came to the attention of the Board of Trustees a movement then under way to promote the enactment of federal legislation under which self-employed persons, including physicians, could provide for their own retirement benefits through the deduction of amounts annually from their taxable income to finance retirement plans. The Board approved this movement with the stipulation that there would be a reasonable limitation on retirement benefits for which provision could be made. This action was commended by our House of Delegates in June, 1948.

In June, 1951, at the annual session of the American Medical Association three resolutions were adopted by the House of Delegates re-emphasizing the Association's endorsement of this principle.

On May 13, 1952, representatives of the Association appeared before this Committee in general support of H. R. 4371 and H. R. 4373, 82d Congress (Dickinson, F. G.: An Analysis of the Keogh-Reed Bill to Encourage Pensions for the Self-Employed, Bulletin 89, Bureau of Medical Economic Research, American Medical Association, 1952). However, at that time various amendments were suggested. The bills which are now pending before your Committee include all of the amendments recommended by the Association at that time.

In June and again in December, 1952, the House of Delegates reiterated its endorsement of these proposals and recommended that each member of the Association give careful study and active support to their passage.

It is the belief of the American Medical Association that physicians, dentists, lawyers, architects, farmers, store owners and the many others who comprise the nation's self-employed have long been neglected in federal tax legislation relating to pensions. The purpose of these bills is to eliminate the discrimination and inequities existing under present tax laws. By extending the tax deferment privilege to the country's 11,000,000 self-employed and also to millions of employees who are not covered by pension plans, this legislation will give them increased incentive to save for their old age during their best earning years.

This legislation will be of particular benefit to physicians who go through a long and costly period of training and whose earnings are bunched into a comparatively short period of years when they are subject to high income tax rates.

The need for such relief was demonstrated recently in the case of Kintner vs. U. S. (107 Fed. Supp. 976) in which the status of physicians in group practice under Section 165(a) of the Internal Revenue Code was in question. Although pointing up the need for the inclusion of physicians, among others, under Section 165(a), the case will not, even if Dr. Kintner's position is upheld, be of significant assistance since less than 5% of private practitioners are involved.

Under the program proposed by the pending bills the amount of each person's pension would be determined by his contributions without one cent being added by the government. In addition, the program would not force a person into idle retirement in order to draw upon his pension fund. Most important, it presents an opportunity for all who can pay for their own retirement to do so.

That, very briefly, indicates the general viewpoint of the American Medical Association toward this legislation. We have collaborated very closely in the development of this legislation with representatives of the American Bar Association, the Association of the Bar of the City of New York and with national organizations of self-employed tax payers who would be afforded some measure of equity taxwise by the enactment of the pending measures. I urge, therefore, that your Committee give favorable consideration to this legislation.

FROM THE SECRETARY'S LETTER

The following item appears in the July 29 issue of the Secretary's Letter, which is sent by A. M. A. Secretary George F. Lull to officers of the American Medical Association and to county and state medical associations:

SPEAKS HIS MIND ON A. M. A. POLICY. In a recent issue of the Utah Medical Bulletin, Dr. K. B. Castleton authored a "President's Page" article on the June meeting of the A. M. A. in New York. He concluded his piece with some pertinent statements regarding A. M. A. policies. He said:

"Many doctors are very critical of the A. M. A. leadership and policies. Many feel that the A. M. A. does not adequately represent the private physician, is undemocratic, ultraconservative, and 'asleep at the switch.'

"After attending the last two House of Delegates meetings, I am convinced that the A. M. A. is conscientiously attempting to do the best job possible, not only for the doctors but what is of much greater importance for the people of this country as a whole so far as medical care is concerned.

"I believe it is a democratic organization, its policies being determined by the House of Delegates, the members of whom are elected by us. I am convinced that these men are honest, hard working, unselfish, intelligent men who are devoting an enormous amount of time, thought and energy to our affairs, and we all owe them a great debt of gratitude. Their work I am sure is not appreciated as it should be. If any of you have any doubts along this line I would suggest that you make it a point to visit the House of Delegates meetings during the next few conventions and watch it work. Go along with George Fister and see how much time and how much hard work is involved.

"If any of you do not like the way the A. M. A. is run, you should make your ideas known at your county medical meetings, introducing resolutions which may be carried to the House of Delegates of the Utah State Medical Association, thence to our delegate and thence to the A. M. A. Every member of our organization has the right and privilege to express his own feeling and to inaugurate changes which will be carried through if there are enough members of the society who believe as he does."

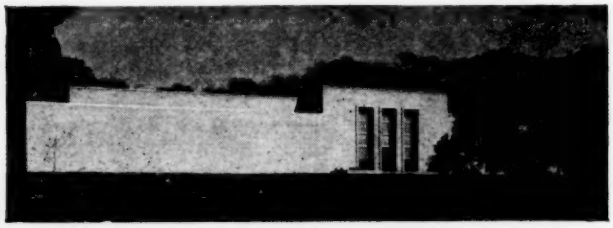
CONFERENCE OF SCHOOL HEALTH LEADERS

The American Medical Association's fourth national Conference on Physicians and Schools, sponsored biannually by the Bureau of Health Education, will be held Sept. 30 and Oct. 1-2 at the Moraine Hotel, Highland Park, Ill. More than 200 representatives of state health departments, state education departments, and state medical societies have been invited to participate in the discussions. Following the theme

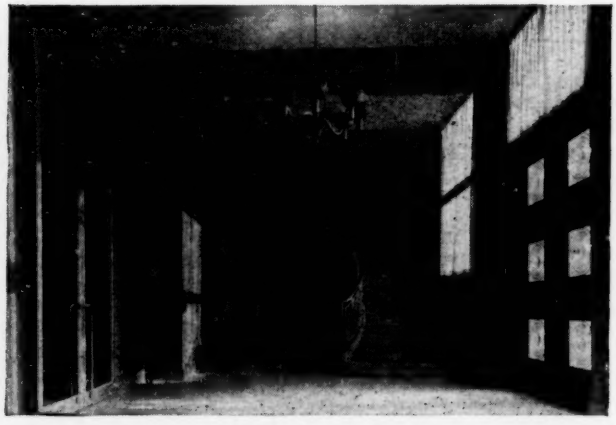
of "Health Services for School Children," those attending the conference will break up into a dozen different groups to discuss specific problems and develop suggested policies and practices. In addition, medical, public health, and educational leaders from 18 large cities will discuss big city problems in school health.

TEXAS MEMORIAL LIBRARY

The Texas Medical Association has placed its offices with its Memorial Library under one single roof. Dedicated in September, 1952, the large and attractive Indiana-limestone structure, affording 32,676 square feet of floor space, houses the entire headquarters for the Texas association. The main library and its supporting units occupy the entire lower floor



and includes a foyer, spacious reading room, rare-book room, the auditorium (named the Sam Thompson Room in honor of Dr. and Mrs. Sam E. Thompson of Kerrville, who have contributed $50,000 for the building and operation of the library), film editing and cutting room, coffee room, and large reference room. The Sam Thompson Room has a complete and modern kitchen for serving the many meetings and film show-



ings held there annually. On the second floor are the executive, business, journal and physician-placement offices, as well as those of public relations, state advisory committee, and the auxiliary. Augmenting these are the mailing and reproduction rooms, central files, and switchboard.

The Memorial Library provides eight hours of service daily to the many association members it serves free of charge. The library also maintains a film loan service, and about 1,000 requests are processed annually. It consists of 150 films for professional persons and 50 for lay audiences.

RECENT A. M. A. PUBLICATIONS

Medical and Hospital Care of Veterans with Non-Service-Connected Disabilities, a Review of American Medical Association policy.

Factbook on Medical Education, based on the 52nd Annual Report on Medical Education in the United States, prepared by the Council on Medical Education and Hospitals.

ADVANCE REGISTRATION FOR CLINICAL MEETING

The Membership-Subscription Department will mail advance IBM registration cards (about Nov. 1, 1953) for the St. Louis Clinical Meeting. These cards will be sent to all members in good standing for the year 1953, in the following states: Alabama, Arkansas, Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Ohio, Oklahoma, Tennessee, Texas, and Wisconsin.

All paid A. M. A. members in states not listed above will be sent advance registration cards on request. All requests should be addressed to the Membership-Subscription Department, Advance Registration Section, 535 N. Dearborn Street, Chicago 10, Ill. For a convenient and speedy registration, physicians are requested to present these advance registration cards at the registration booth, Keil Auditorium, St. Louis, on the following registration days and hours: Nov. 30, 10 a. m. to 4 p. m., Dec. 1-4, 8:30 a. m. to 5:30 p. m.

SCROLLS FOR COFOUNDERS OF RURAL HEALTH COUNCIL

Scrolls of appreciation from their friends and associates in rural health work are presented to Mrs. Charles W. Sewell of Otterbein, Ind., and Dr. F. S. Crockett of Lafayette, Ind., the two cofounders of the Council on Rural Health of the American Medical Association. The scrolls, signed by all

members of the Council and of its Advisory Committee, were presented during the recent Summer Agricultural Conference at Purdue University. Taking part in the program (left to right) were Dr. Paul D. Crimm of Evansville, president of the Indiana State Medical Association; Dr. George F. Lull of Chicago, Secretary and General Manager of the American Medical Association; Mrs. Sewell; Dr. Crockett; and L. E. Hoffman, associate director of agricultural extension at Purdue and a member of the Indiana Rural Health Committee.

PUBLIC RELATIONS IN THE DOCTOR'S OFFICE

Several medical societies have purchased quantities of the A. M. A. office plaque, "To All My Patients," for distribution to their members. The Dade County Medical Association in Miami ordered 1,000 plaques to be placed in every doctor's office in the city. The Oklahoma State Medical Association requested a supply of plaques for presentation to all of its incoming members. Designed by the American Medical Association, this plaque invites patients to feel free to ask questions regarding the doctor's services or fees. Individual physicians may purchase plaques from the Order Department, 535 North Dearborn Street, Chicago 10, Ill. The price is one dollar per copy.

MEDICAL NEWS

ALABAMA

Dr. Hannon Honored.—At its conference in Ft. Morgan, the Alabama Crippled Children's Rehabilitation Service honored Dr. William C. Hannon, Mobile, for "his outstanding work with crippled children of this area during the past 25 years." It was pointed out that most of Dr. Hannon's work was "where his only reward was the satisfaction of knowing he was helping some unfortunate person to lead an easier and happier life." One of his patients, a 13-year-old boy, was a guest of honor. A television set was presented to Dr. Hannon.

CALIFORNIA

Stanford Medical School to Move to Palo Alto.—The board of trustees of Stanford University, Stanford University-San Francisco, has announced that the university's new medical school will be constructed on the Palo Alto campus within three to five years. According to the president, J. E. Wallace Sterling, the decision to move the medical school is based on the conviction that the future of medical education is dependent on the course of medical science, which has become increasingly dependent on the basic physical sciences and the social sciences. "This key relationship of medical education and science to other scientific fields," he stated, "can best be strengthened and advanced by bringing the medical school into the closest possible physical and intellectual relationship to the whole university." It is anticipated that affiliated facilities, such as the Stanford University Hospitals, Stanford School of Nursing, Lane Medical Library, and Stanford clinics, will be brought to the Palo Alto campus but that the university will continue its postgraduate programs at San Francisco Hospital.

COLORADO

Dr. Marcial to Study Abroad.—Dr. Victor A. Marcial, who is affiliated with Penrose Cancer Hospital, Colorado Springs, left recently to attend the International Congress of Radiobiology in Copenhagen, Denmark, before visiting the Radiumhemmet in Stockholm, Sweden. He plans to study at the Royal Cancer Hospital and the Mayerstein Institute of Radiotherapy in London, the Holt Radium Institute of Manchester, England, and the Radium Institute of the University of Paris (Sorbonne) in France. Dr. Marcial will attend the International Cancer Congress in São Paulo, Brazil, before returning to the United States in 1954. The American Cancer Society recently chose Dr. Marcial as the first recipient of a fellowship to continue work in therapeutic radiology.

ILLINOIS

Personal.—Dr. Guy F. Turner was guest of honor at the annual homecoming in Long Point, where he has practiced medicine for 50 years. Dr. Turner has also served Long Point as postmaster, head of the village board, and president of the high school board of education.

Scientific Speakers Wanted.—The scientific service committee of the Illinois State Medical Society is revising, for the first time since 1947, its list of speakers available to county medical societies. Physicians wishing to be included are urged to send in their names together with a list of the subjects for which they would be available. If the physician does not have a teaching position connected with a medical school, his hospital staff affiliation should be included. Mention should also be made of the type of slides used in talks and titles of movies if available. Submit data to Dr. Louis R. Limarzi, chairman, Scientific Service Committee, Illinois State Medical Society, Room 801, 185 N. Wabash Ave., Chicago 1.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education and public health. Programs should be received at least three weeks before the date of meeting.

Chicago

Hospital Commemorative Units.—Former members of Passavant Memorial Hospital's medical staff, who had prominent roles in the development of the hospital, will be honored by commemorative units in the new south pavilion. To date the following commemorative units have been organized: Dr. Arthur H. Curtis, professor emeritus of obstetrics and gynecology and former chairman of the department at Northwestern University Medical School and Passavant Hospital, and the late Drs. Marion H. Barker, Sanford R. Gifford, David S. Hillis, and Walter H. Nadler.

Cancer Trust Fund.—The University of Chicago School of Medicine announces receipt of the first income, a $1,000 check, from the Gordon Stephenson trust of $123,325, presented to the university for "cancer research and for the treatment and care of persons afflicted with cancer." The bequest was in the will of the late Gordon Stephenson, former operating superintendent of Sears, Roebuck and Company, an alumnus of the university, who requested that his residuary estate be held in perpetuity and the net income paid to the university. During the first 25 years, the university will receive one-half of the net income with the other half added to the principal of the fund.

IOWA

Pediatrics Conference at Iowa City.—The State University of Iowa College of Medicine, Iowa City, announces a postgraduate conference in pediatrics, Sept. 16-17, sponsored jointly by the department of pediatrics, Iowa Pediatric Society, Maternal and Child Health Division of the State Department of Health, and the State University of Iowa Council on Children and Youth. The Philip C. Jeans memorial program will be presented at 1:30 p. m. Thursday, when remarks will be made by Dr. Jean V. Cooke, Washington University School of Medicine, St. Louis, Leonard A. Maynard, Ph.D., Cornell University, Ithaca, N. Y., and Dr. James R. Wilson, secretary of the A. M. A. Council on Foods and Nutrition, Chicago. At 4 p. m. there will be a eulogy of Dr. Jeans and dedication of the pediatric library in his memory. Other guest speakers at the conference include:

Madelene M. Donnelly, Des Moines, Stillbirths and Neonatal Deaths in Iowa.
Frederick C. Blodi, Iowa City, Pathogenesis of Retrolental Fibroplasis.
James B. Arey, Philadelphia, Pathologic Lesions Responsible for Respiratory Disturbances in the Newborn.
Edmund G. Zimmerer, Des Moines, The State Department of Health and the Welfare of Children in Iowa.
Ralph Bowen, Houston, Texas, Allergy in Identical Twins.
Harold E. Stadler, Indianapolis, Heredofamilial Cerebral Degeneration in Infancy: The Relationship of Systematic Factors to the Pathogenicity.
Ralph Spaeth, Chicago, Tetanus or Serum Sickness.
Charles U. Lowe, Buffalo, Some Effects of Cortisone and ACTH upon Cellular Metabolism.

KANSAS

Chest Physicians Organize.—The recently organized Kansas chapter of the American College of Chest Physicians has elected the following officers to serve for the first year: president, Dr. Charles Pokorny, Halstead; vice-president, Dr. Arthur L. Ashmore, Wichita; secretary-treasurer, Dr. Carl J. W. Wilen, Manhattan; and program chairman, Dr. E. L. Andre Baude, Topeka. Governor for the state of Kansas is Dr. Charles F. Taylor, Norton. Inquiries regarding membership should be addressed to Dr. Taylor at State Sanatorium for Tuberculosis, Norton.

Personal.—Dr. Geoffrey M. Martin, who has returned to Topeka after a year's postgraduate study at Harvard University, has resumed his duties as director of the division of maternal and child health, Kansas State Board of Health. Dr. Patricia Schloesser, who served as acting director of the

division while Dr. Martin was on educational leave, is now with the division as pediatric consultant.——Dr. Philip A. Bearg, Topeka, has been transferred from the division of maternal and child health, where he was a pediatric consultant, to the division of preventable diseases, where he will be in charge of epidemiology.

MARYLAND

Award to Baltimore Sunpapers.—According to the U. S. Department of Health, Education, and Welfare, a "mental health bell," cast from shackles once used to restrain mental patients, was awarded to the Baltimore Sunpapers for their "outstanding service in the fight against mental illness." The award, made by Dr. George S. Stevenson, New York, medical director of the National Association for Mental Health, was based on the papers' five year crusade, which resulted in tripling of the operating budget and appropriation of 20 million dollars for Maryland's mental health hospitals. The Sunpapers, Dr. Stevenson noted, "also gave continuing support to setting up community mental health facilities and to appropriation of funds to maintain these facilities." The bell will be kept on display until Mental Health Week, 1954, when it will be awarded to the newspaper, magazine, radio, or television chain or station that has done most to advance mental health in the preceding year.

MICHIGAN

Carl Mitchell Memorial Chapel.—In recognition of "the outstanding Christian devotion and churchmanship" of the late Dr. Carl A. Mitchell, the official board of the Benton Harbor First Christian Church, of which he was a member and elder for nearly 40 years, has designed a "Dr. Carl A. Mitchell Memorial Chapel" in the church's new educational building. All memorial funds now on hand, presented in honor of Dr. Mitchell, and future contributions to the memorial fund, will be used to furnish the chapel. Dr. Mitchell was instrumental in planning and erecting the present church edifice in 1913.

Personal.—Dr. Clark D. Brooks, Detroit, has retired as a member of the Detroit board of education after serving in that capacity for 14 years and twice as its president. Dr. Brooks, aged 73, has been a surgeon on the staff of Harper Hospital.——Dr. Alfred LaBine, Houghton, was recently honored when the Fourth Degree Assembly of the Copper Country Knights of Columbus named its 50 candidate class for him, terming the initiatory group the "Sir Knight Dr. Alfred LaBine Class." Dr. LaBine has served as president of the Upper Peninsula Medical Society and of the Houghton, Keweenaw, and Baraga County Medical Society, and has been chief of staff of St. Joseph's Hospital in Hancock.——Dr. George N. Petroff, Pontiac, was elected as father-of-the-year by the Pontiac Boys' Club, which awarded him a bronze plaque. Dr. Petroff, who has been active in Boys' Club and Boy Scout work, is physician for Pontiac and St. Michael high schools.——Dr. William R. Storer has been appointed St. Joseph County health director, succeeding Dr. Ernest A. Cook, Corunna, who resigned to accept a similar position in West Virginia. Dr. Storer is making his home at North Twin Beach.——A scroll, signed by 200 tuberculosis patients at Saginaw County Hospital, was presented to Dr. Vladimir K. Volk, Saginaw, hospital superintendent, as a tribute for his role in bringing television into the room of every patient at the hospital. A picnic preceded the ceremony. The event marked the official opening of a recreation area for use by ambulatory patients.

MINNESOTA

Annual Fahr Lecture.—The annual George E. Fahr lecture will be delivered by Dr. William F. Hamilton, professor of physiology, Medical College of Georgia, Augusta, on the University of Minnesota campus in Minneapolis at 8 p. m., Sept. 14. The lecture on "The Physiology of Congestive Failure of the Circulation" will be open to all physicians and investigators. Dr. Hamilton will also participate in the "Symposium on Recent Advances in Cardiovascular Physiology and Surgery" that will be presented by the university and the Minnesota Heart Association, Sept. 14-16.

Southern Minnesota Medical Association.—The annual meeting of the Southern Minnesota Medical Association will be held at St. John's Catholic School, Mankato, Sept. 14. The presidential address by Dr. Helmer J. Nilson, North Mankato, will follow remarks by Dr. Orwood J. Campbell, Minneapolis, president of the Minnesota State Medical Association, at the banquet, Mankato Country Club, 6:30 p. m., after which Dr. Leo G. Rigler, Minneapolis, will present "Medical Tour of India." Other speakers include Drs. John C. Mickelson and William S. Chalgren, Mankato; Harlan A. Alexander, Stanley R. Maxeiner, and Ivan D. Baronofsky, Minneapolis; Donald R. Lannin and Edward J. Richardson, St. Paul; Heinz H. Bruhl, Faribault; Robert F. Mears, Northfield; and Edmund C. Burke, Louis E. Prickman, James M. Stickney, Stephen D. Mills, and Henry W. Dodge Jr., Rochester.

MISSOURI

Cardiac Consultation Clinic.—The first clinical session of the Regional Cardiac Consultation Clinic will be held Sept. 16, 9 a. m., at St. John's Hospital in Springfield. The clinic, which is sponsored by the Greene County Medical Society with the cooperation of the Missouri Heart Association, will be held regularly each Wednesday morning at St. John's Hospital. Patients will be accepted only by referral from their physicians. On termination of the study of the patient at the clinic, a report will be sent to the referring physician. Patients from anywhere in southwest Missouri in need of special consultation and who cannot afford such services through regular channels will be admitted to the clinic without charge. The purpose is diagnosis only. The members of the clinic staff will serve without remuneration. Facilities at St. John's Hospital have been made available to the medical society for this program. Staff appointments are made for a three month period, and, in addition to the active staff, all members of the Greene County Medical Society are considered members of the staff to the extent that they are to be available for consultation as the occasion may arise.

MONTANA

Dr. Danskin Honored.—Dr. Melville G. Danskin, Glendive, a past vice-president of the Montana Medical Association, was honored at a public reception at the Methodist Church after he announced his intention to retire from active practice and move to Billings. Dr. Danskin, who has served about 42 years in Glendive and eastern Montana, was appointed county health officer for Dawson County in 1916 and, with the exception of two years, served in that capacity to June 1. Named physician in charge of the Dawson County Hospital in 1916, he has remained in that position. From 1923 to 1927, he was mayor of Glendive and has served as president of the state health officers' association and as the first president of the local Kiwanis Club.

NEW YORK

Albert Fellowships Established.—The establishment of two fellowships for clinical and experimental research has been announced by the trustees of the Jewish Sanitarium and Hospital for Chronic Diseases, Brooklyn. The fellowships, named in honor of the president of the hospital, Mr. Isaac Albert, will be awarded during the fall of 1953. Applicants should write to Arthur Feigenbaum, hospital superintendent, Rutland Road and East 49th St., Brooklyn.

University News.—Dr. A. Harry Rubenstein, who has been affiliated with the State University of New York College of Medicine at Syracuse since 1925, has been appointed professor and chairman of the department of otolaryngology, and Dr. Robert O. Gregg has been named professor and part-time chairman of the department of surgery.——Dr. Gordon D. Hoople, who has been on the staff since 1926, is now professor emeritus of otolaryngology. Dr. Hoople initiated the

first full-time medical service to students at Syracuse University. The new speech and hearing center was recently named in his honor.——Dr. Arthur B. Raffl, who joined the staff in 1926 and became professor of surgery in 1946, has been appointed professor emeritus of surgery.

OHIO

Meeting of Anesthesiologists.—The annual meeting of the Ohio Society of Anesthesiologists will be held at the Wade Park Manor Hotel, Cleveland, Sept. 12. Dr. Perry P. Volpitto, Augusta, Ga., will discuss "Management of Anesthesia in Children" and "Problems of Anesthesia in Operative Obstetrics" and will participate in a symposium on intubation, in which the moderator will be Dr. Rolland J. Whitacre, Cleveland, and the other participants Drs. Lloyd E. Larrick, Cincinnati, and Reynold M. Crane, Cleveland.

General Practitioners Meet in Cleveland.—The annual scientific assembly of the Ohio Academy of General Practice will be held at the Hotel Cleveland in Cleveland, Sept. 16-17. As closing features of the scientific program Dr. Duncan E. Reid, professor of obstetrics, Harvard Medical School, Boston, will discuss "Pregnancy Accidents Associated with Alterations in the Hemostatic Mechanism," and Dr. Jerome W. Conn, professor of internal medicine, University of Michigan Medical School, Ann Arbor, will speak on "Spontaneous Hypoglycemia: Differential Diagnosis and Management." At the banquet in the Grand Ballroom, 7 p. m., Wednesday, Dr. George Crile Jr., Cleveland, will present a movie and talk on "Treasure Hunting Holiday."

Personal.—Dr. Marion A. Blankenhorn, professor of medicine, University of Cincinnati School of Medicine, recently served as professor of medicine pro tem at Georgetown University School of Medicine, Washington, D. C., and acted as director of the educational activities of the department of medicine at Georgetown University Hospital and Georgetown University School of Medicine.——Dr. Carl J. Wiggers, who recently retired as director of the department of physiology, Western Reserve University School of Medicine, Cleveland, has become associated with the Frank E. Bunts Educational Institute affiliated with the Cleveland Clinic Foundation.——Dr. Lawrence H. Miller, Granville, was appointed professor of health education and director of student health services at Denison University.——Dr. Max M. Zinninger, associate professor of surgery, University of Cincinnati College of Medicine, delivered the first George J. Heuer lecture in New York, when Dr. Heuer's portrait was presented to the Cornell University Medical College, of which he is emeritus professor of surgery. Dr. Heuer, who now lives in Rye, N. Y., was professor of surgery at the University of Cincinnati College of Medicine from 1922 to 1931. Dr. Zinninger also gave a talk on "Development of the Resident Training System at the Cincinnati General Hospital" for Pi Kappa Epsilon's annual dinner and initiation of new members in Cincinnati.

PENNSYLVANIA

Fifty Year Plaques.—The Luzerne County Medical Society recently awarded 50 year plaques to Drs. Roy Truckenmiller, Freeland, Harry A. Brown, Lehman, Austin L. Hauslohner, Wilkes-Barre, William C. Stiff, Forty Fort, and Wilbur A. Foster, Mountaintop.

Reorganize Alumni Association.—Graduates of Jefferson Medical College of Philadelphia met recently at the Harrisburg Academy of Medicine to reorganize the South Central Pennsylvania Jefferson Alumni Association that had not met since 1941. Dr. Norman B. Shepler, Harrisburg, was elected president; Dr. Roy W. Gifford, Gettysburg, vice-president, and Dr. Raymond C. Grandon, Harrisburg, secretary-treasurer.

Memorial to Dr. Pennell.—A plaque was recently dedicated in honor of the late Dr. Howard Y. Pennell by the x-ray department of the Chester County Hospital, West Chester. Dr. Pennell, who died in 1952, had been associated with the hospital for 54 years; he came there as its first intern. He later became a permanent staff member and director of the x-ray department, which he founded in 1909. Among those participating in the dedicatory ceremonies were Arthur E. James, Ph.D., and Drs. Jacob Gershon-Cohen, Philadelphia, and Louis S. Bringhurst, West Chester.

Appoint Superintendent of Sanatorium.—Dr. Sterling B. Brinkley, Johnstown, will become medical superintendent of the Gaylord Farm Sanatorium in Wallingford, Conn., Oct. 1. He succeeds Dr. David Russell Lyman who, 50 years ago, became the original head of the sanatorium and who will now become medical superintendent emeritus. Dr. Brinkley has been affiliated with the Gorgas Hospital, Ancon, Canal Zone, the Cornell University Medical College, New York, and Yale University, New Haven, Conn. He is a director of the Pennsylvania Tuberculosis and Health Society and of Yale in China and is vice-president of the Pennsylvania Rehabilitation Association. Dr. Brinkley was commanding officer of an infantry division-collecting company in the European theater for two years.

Philadelphia

University News.—Dr. William T. Lemmon has been made a full professor of medicine at Jefferson Medical College of Philadelphia. He had been clinical professor of surgery and served also as assistant professor of applied anatomy.

Meeting on Cytology.—The first annual meeting of the Inter-Society Cytology Council will be held in Philadelphia Nov. 19-20. Those interested in presenting papers pertaining to the cytological method for the diagnosis of cancer and related subjects are urged to send titles, together with an abstract of not more than 300 words, to the chairman of the program committee, Dr. Abraham E. Rakoff, Jefferson Medical College, 1025 Walnut St., Philadelphia 3.

Personal.—Dr. William M. Hart, assistant professor of ophthalmology, Jefferson Medical College of Philadelphia, has been appointed chief of the ophthalmology clinics of the National Institute of Neurological Diseases and Blindness, Public Health Service, Bethesda, Md.——Dr. Garfield G. Duncan left July 30 for a teaching tour in New Zealand and Australia. He will head a three week course in internal medicine under the auspices of the New Zealand Post-Graduate Association in Auckland and will deliver the Cunning memorial lecture on "Undernutrition as Encountered in General Practice" before the Royal Australasian College of Physicians at Dunedin. In Australia he will lecture on "Essential Hypertension" at Sydney.

TENNESSEE

Anonymous Gift to Vanderbilt University.—Dr. John B. Youmans, dean, Vanderbilt University School of Medicine, Nashville, announces that an anonymous donation of $40,000 will be used to establish a laboratory for clinical microbiology. It is anticipated that an additional sum of $15,000 a year for four years soon will be made available from the same source. The laboratory will be under the departmental supervision of Dr. Hugh J. Morgan, head of the department of medicine.

TEXAS

Postgraduate Courses.—The Houston division of the University of Texas Postgraduate School of Medicine offers a 6 week course in diabetes on Tuesday evenings, beginning Sept. 15; a 6 week course in acute infectious diseases Tuesday evenings, beginning Nov. 10; wet surgery clinics for 10 weeks on Friday mornings, beginning Sept. 25; and a 12 week series on cardiology and electrocardiography on Monday evenings, beginning Sept. 28 in Austin. The San Angelo division will hold medical conferences each Sunday, beginning the latter part of September. Information may be obtained from the Dean, University of Texas, Postgraduate School of Medicine, 1400 Outer Belt Drive, Houston 25.

North Texas-Southern Oklahoma Conference.—The program of the North Texas-Southern Oklahoma Fall Clinical Conference will be presented by members of the staff of Johns Hopkins University School of Medicine, Baltimore, at the Wichita Falls Country Club in Wichita Falls Sept. 16. For the morning session Dr. Jack S. Guyton, professor of ophthalmology, will present "Treatment of Squint," Dr. Samuel P. Asper, associate professor of medicine, "Clinical Use of Cortisone and ACTH," and Dr. Alan C. Woods Jr., instructor, "Surgical Treatment of Complications of Cirrhosis." After luncheon followed by a round-table question and answer period, Dr. Asper will speak on "Newer Aspects in Treatment of Thyroid Diseases," Dr. Woods on "Surgical Treatment of Cancer of the Thyroid," and Dr. John T. Grayhack of the Johns Hopkins Hospital staff on "Diagnosis and Treatment of Operable and Inoperable Prostatic Cancer." Dinner at 7:30 p. m. will be preceded by a cocktail hour. The registration fee, $8, includes luncheon, dinner, scientific programs, and entertainment; ticket for lady guest for dinner and the evening program, $4. Address inquiries to Dr. L. Nolan Simmons, 1518 10th St., Wichita Falls.

WEST VIRGINIA

Personal.—Dr. Frank J. Holroyd, Princeton, has been elected president of the state medical licensing board. He succeeds Dr. Walter E. Vest, Huntington, who has been president since the creation of the board in 1949.

Annual Seminar at Bluefield.—The Bluefield Sanitarium will hold its first annual clinical seminar in the staff room, Oct. 2. Discussion periods and exhibits by the departments of urology, clinical pathology, neurosurgery, roentgenology, and ophthalmology and otolaryngology will be included in the program. Guest speaker at the banquet at the Bluefield Country Club will be Dr. George T. Harrell Jr., professor of medicine, Bowman Gray School of Medicine, Winston-Salem, N. C., who will discuss "Myxedema."

WISCONSIN

Diabetes Forum.—The fall postgraduate program at the Marquette University School of Medicine, Milwaukee, will open Sept. 19 with a one day forum in diabetes mellitus, which will be presented by the medical school in cooperation with the Wisconsin Diabetes Association. Dr. William W. Engstrom, associate professor of medicine, will direct the forum. Dr. Francis R. Keating Jr., consultant in medicine, Mayo Clinic, Rochester, Minn., is to be guest speaker. Reservation for the day, which includes luncheon, should be made through the Director of Postgraduate Programs, Marquette University School of Medicine.

HAWAII

Personal.—Dr. Charles L. Wilbar Jr. for 10 years president of the Hawaii Territorial Board of Health, has been appointed assistant health executive of the State of Pennsylvania. Dr. Richard K. C. Lee, assistant health executive of the Hawaii Territorial Department of Health since 1943, and prior to that deputy commissioner of public health since 1937, will succeed Dr. Wilbar as president of the board of health.

Industrial Health Meeting.—The meeting in Honolulu of the Territorial Association of Plantation Physicians, a component society of the Industrial Medical Association, heard Dr. George F. Wilkins, Boston, Industrial Medical Association president, give an address on "The Future of Industrial Medicine." Dr. Earl F. Lutz, Detroit, associate medical director, General Motors, discussed "Health Plans in Big Industry." At the industrial medicine and medical economics panel luncheon, Dr. William H. Wilkinson, Wahiawa, served as moderator, and Drs. Lutz, Edward C. Holmblad, Chicago, Leo Price, New York, Frank Hatlelid, Waialua, Sam Wallis, Lihue, J. Alfred Burden, Paia, and Francis J. Halford, Honolulu, were among the panel participants.

Surgical Wing at Queen's Hospital.—The public subscription campaign to raise the final $600,000 needed to provide a new surgical wing at the Queen's Hospital, Honolulu, was recently concluded. First to memorialize sections of the new building was a retired physician, Dr. Tang L. Wong, who gave $10,000 under a new living memorial plan developed by hospital officials. The total cost of the entire development at the institution will be about $1,400,000. In addition to 14 new operating rooms, a 12 bed postoperative recovery ward, and an auditorium seating 80, the new wing allows the removal of the pediatric unit into fire-resistant quarters and inclusion of an isolation unit, use of former operating rooms as an expanded laboratory with additional research rooms, addition of 106 new beds with replacement of 84 declared unacceptable, and removal of the outpatient clinic to largely expanded quarters in older wings. Dr. Forrest J. Pinkerton headed the solicitation of funds from professional groups in the islands.

GENERAL

Appoint Medical Adviser.—American Leprosy Missions, Inc. (156 Fifth Ave., New York 10) announce the appointment of Robert G. Cochrane, M.D. (Glas.), F.R.C.P. (Lond.), D.T.M. & H. (Eng.), as technical medical adviser. His services will be available to all physicians working in leprosy colonies or clinics connected with Protestant missions and to any others who may solicit his advice. Dr. Cochrane will continue for the present to maintain an office and a laboratory in London but will make periodic trips to Asia, Africa, South America, and the United States.

Antibiotics Award.—At the annual convention of the Society of American Bacteriologists in San Francisco, the 1952 Commercial Solvents Award in Antibiotics, consisting of a gold medal, $1,000, and engraved scrolls, was presented to Ibert C. Wells, Ph.D., Syracuse, N. Y., Edwin E. Hays, Ph.D., Chicago, Dr. Edward A. Doisy, St. Louis, and William L. Gaby, Ph.D., Philadelphia, for their work with Pseudomonas aeruginosa. Their 10 years of research, started at St. Louis University in the early days of World War II, demonstrated that in addition to pyocyanine, Pseudomonas aeruginosa produces several other antibacterial agents. The group worked out methods of isolation, separation, and purification of these agents, defined their physical and chemical properties, proposed structural formulas for them, and, by degradation and synthesis, proved the acceptability of the proposed formulas.

North Pacific Internal Medicine Meeting.—The North Pacific Society of Internal Medicine will hold its annual fall meeting at Harrison Hot Springs, B. C., Canada, Sept. 18-19. The evening preceding the meeting there will be cocktails and a reception, 6-7 p. m. The scientific program is as follows:

Charles N. Holman, Portland, Ore., The New General Hospital at the University of Oregon Medical School.
Joseph H. Delaney, Spokane, Wash., Thyrotoxic Heart Disease.
Russell B. Hanford, Spokane, Wash., Are Vagal Inhibitors of Use in Treatment of Intermittent Atrioventricular Block?
Ralph H. Huff, Tacoma, Wash., Clinical Conditions Simulating Coronary Artery Disease.
Kyran R. E. Hynes, Seattle, Significance of Cardiac Vectors.
Raymond A. McMahon, Portland, Ore., Observations on the Conducting System of Congenital Heart Cases.
E. Murray Burns, Portland, Ore., Emulsifying Agents in Digestive Disorders.
Robert H. Williams, Seattle, Recent Advances Relative to Diabetes.
Hamish W. McIntosh, Vancouver, B. C., Observations on the Electrolyte Metabolism in Stress.
Earl D. DuBois, Portland, Ore., Diagnosis and Treatment of Disturbances Arising from the Sphincter of Oddi.
George A. Boylston, Portland, Ore., Peptic Ulcer of the Pyloric Ring.

Cardiac Grants-In-Aid.—On its fifth anniversary as a voluntary health agency, the American Heart Association announced that, jointly with its affiliates, it had awarded an additional $473,930.59 for 89 research grants-in-aid in the field of heart and blood vessel diseases. The latest awards increase to a grand total of almost 6.5 million dollars the sums spent for research studies by the American Heart Association and its affiliated state and local associations over the five year period. Of the continued grants the largest went to Samuel Gurin, Ph.D., University of Pennsylvania School of Medicine, Philadelphia, $10,500 (how cholesterol and fats are built up by the body with special regard to the role of hor-

mones in this process), and Dr. Albert Szent-Gyorgyi, Marine Biological Laboratories, Woods Hole, Mass., $10,000 (further studies on the molecular changes that occur within muscle during muscular contraction). Highest grants for new projects were awarded to Bernardo A. Houssay, Instituto de Bioligia y Medicina Experimental, Buenos Aires, Argentina, $10,000 (studies on experimental high blood pressure); James D. Ebert, Indiana University School of Medicine, Bloomington, $9,607.50 (the study of two substances, actin and myosin, thought to be important in the work of the heart muscle); and Dr. John J. Osborn, New York University-Bellevue Medical Center, $8,268.75 (use of refrigeration and of a heart-lung machine in temporarily interrupting the circulation to facilitate surgery).

Western Tuberculosis Conference.—The first meeting of the Western Tuberculosis Conference will be held at the Hotel Utah, Salt Lake City, Sept. 17-19. The general sessions will open Thursday, 2 p. m., with a discussion of Indian health problems, after which Dr. Lloyd K. Swasey, Phoenix, Ariz., will serve as chairman for a discussion of "Laws Regarding Sanatorium Care and Isolation of Patients." On Friday morning, which will be devoted to clinics, Dr. Francis J. Weber, Denver, will be chairman for "Future Responsibility of the State and Local Health Departments in Tuberculosis Control Activities" and Dr. Terrell O. Carver, Boise, Idaho, for "The Tuberculosis Control Program in Low Prevalence Areas—In Sparsely Populated Areas." After luncheon Dr. Daniel W. Zahn, Seattle, will preside at the general session. The banquet at 7 p. m. in the Empire Room will be followed by a general session, with Dr. John Z. Bowers, Salt Lake City, presiding. Saturday morning Dr. William H. Oatway Jr., La Vina, Calif., will speak on "Implications of Advances in Medical Diagnosis and Treatment," and Dr. Sidney H. Dressler, Denver, will present "The Denver Study in Retrospect." Dr. George Jacobson, Los Angeles, will address the general session at luncheon Saturday, 12:30 p. m., on routine roentgenograms of general hospital admissions. A special medical session will be held Friday in the Little Theatre, where the following presentations will be made:

John H. McClement, Salt Lake City, Cardiopulmonary Function in Pulmonary Sarcoidosis.
Thomas H. Holmes III, Seattle, Stress and Tuberculosis.
John W. Berry, James C. Bell, and Dick K. Riemensnider, Denver, Place of Slide Culture in Pulmonary Tuberculosis and Suspected Tuberculosis.
Gardner Middlebrook, Denver, Bacteriology of Tuberculosis.
Maxwell M. Wintrobe, Salt Lake City, Anaemia of Infection.
William S. Conklin, Portland, Ore., Surgical Trends in Pulmonary Tuberculosis.
William H. Oatway Jr., La Vina, Calif., Subject to be announced.

Annual Clinicians Meeting in Chicago.—The annual session of the American Association of Medical Clinicians will be held at the Congress Hotel, Chicago, Oct. 9-11, under the presidency of Dr. Clair L. Stealy, San Diego, Calif. The sessions will open Saturday, 10 a. m., with a panel on "Prepaid Medical Care Plans: Status and Problem," for which Dr. Wayne Gordon, Billings, Mont., will serve as moderator. The presidential address and an address by Dr. Alton Ochsner, New Orleans, will be delivered at the luncheon, 12:30 p. m. A cocktail party, courtesy of Marshall Field Clinic, will follow the afternoon business session. Dr. Edwin P. Jordan, Charlottesville, Va., executive director of the association, will address the professional problems session, Sunday, 9:30 a. m., on "Professional Composition of Group Practices." Dr. R. Franklin Jukes, Akron, Ohio, will be moderator for a panel on "Problems in Internal Structure and Organization of Clinics" at 9:50 a. m., and Dr. Charles V. Edwards, Council Bluffs, Iowa, will moderate a panel discussion on "Physician's Role in Clinic Personnel Policies" at 11 a. m. Mr. Leo E. Brown, Director, A. M. A. Department of Public Relations, will be guest speaker at the luncheon, 12:30 p. m., and will discuss "PR Profits vs. Dollar Profits." At 2:20 p. m. "Should Clinics Require Staff Members to Sign Agreements Restricting Their Right to Practice in the Community" will be presented by Dr. Harold D. Caylor, Bluffton, Ind., and Mr. George E. Hall of the A. M. A. Bureau of Legal Medicine and Legislation.

Prevalence of Poliomyelitis.—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States, its territories, and possessions in the weeks ended as indicated:

Area	Aug. 29, 1953: Paralytic Type	Aug. 29, 1953: Total Cases Reported	Aug. 30, 1952 Total
New England States			
Maine	9	23	14
New Hampshire	..	7	3
Vermont	4	5	3
Massachusetts	17	38	59
Rhode Island	13	26	7
Connecticut	2	25	32
Middle Atlantic States			
New York	60	216	192
New Jersey	30	55	54
Pennsylvania	..	85	89
East North Central States			
Ohio	34	180	208
Indiana	..	33	82
Illinois	66	171	276
Michigan	72	181	286
Wisconsin	..	68	183
West North Central States			
Minnesota	39	185	281
Iowa	14	61	286
Missouri	10	57	66
North Dakota	4	20	21
South Dakota	..	11	55
Nebraska	1	16	177
Kansas	..	38	110
South Atlantic States			
Delaware	..	3	9
Maryland	18	37	12
District of Columbia	1	2	13
Virginia	15	65	52
West Virginia	15	38	43
North Carolina	8	44	34
South Carolina	2	7	2
Georgia	10	22	26
Florida	5	16	8
East South Central States			
Kentucky	9	23	120
Tennessee	5	30	27
Alabama	6	12	7
Mississippi	..	18	15
West South Central States			
Arkansas	9	16	29
Louisiana	4	13	30
Oklahoma	12	31	63
Texas	16	63	163
Mountain States			
Montana	3	16	11
Idaho	..	2	36
Wyoming	..	..	4
Colorado	9	13	28
New Mexico	..	5	39
Arizona	7	21	10
Utah	..	20	16
Nevada	..	2	..
Pacific States			
Washington	..	20	90
Oregon	8	17	36
California	97	181	155
Territories and Possessions			
Alaska	1	1	..
Hawaii	..	..	4
Puerto Rico	1	1	1
Total	636	2,240	3,567

CANADA

Anesthesia Research Meeting.—The International Anesthesia Research Society will meet at the Chateau Frontenac, Quebec, Oct. 26-29. Dr. A. William Friend, Akron, Ohio, will serve as moderator Thursday morning for a panel discussion on "Further Evaluation of Elective Hypotension as an Adjunct to Surgery." Participants will include Drs. Charles R. Stephen, Ruth C. Martin, and William K. Nowill, Durham, N. C., who will present "Production of Controlled Hypotension During Surgery with Pendiomide," Dr. Max S. Sadove, Chicago, who will discuss "Arfonad and True Controlled Hypotension," and Drs. Nicholas M. Greene, Rochester, N. Y., C. Paul Boyan, New York, and David M. Little Jr., New Haven, Conn. Thursday afternoon Dr. Morris J. Nicholson, Boston, will be moderator for a panel on "Hospital Hazards and Their Control," with Drs. D. Dwight Grove, Philadelphia, and George J. Thomas, Pittsburgh, as collaborators.

MEETINGS

AMERICAN MEDICAL ASSOCIATION: Dr. George F. Lull, 535 North Dearborn St., Chicago 10, Secretary.

1953 Clinical Meeting, St. Louis, Dec. 1-4.

1954 Annual Meeting, San Francisco, June 21-25.

1954 Clinical Meeting, Miami, Florida, Nov. 30-Dec. 3.

1955 Annual Meeting, Atlantic City, N. J., June 6-10.

1955 Clinical Meeting, Boston, Nov. 29-Dec. 2.

NATIONAL CONFERENCE ON PHYSICIANS AND SCHOOLS, Moraine-on-the-Lake Hotel, Highland Park, Ill., Sept. 30-Oct. 2. Dr. W. W. Bauer, 535 N. Dearborn St., Chicago 10, Director.

AMERICAN ACADEMY FOR CEREBRAL PALSY, Western Hills Hotel, Fort Worth, Texas, Oct. 30-31. Dr. Harry E. Barnett, 116 S. Michigan Blvd., Chicago 3, Secretary.

AMERICAN ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY, Palmer House, Chicago, Oct. 12-16. Dr. W. L. Benedict, 100 First Avenue Bldg., Rochester, Minn., Executive Secretary.

AMERICAN ACADEMY OF PEDIATRICS, Municipal Auditorium, Miami, Fla., Oct. 6-9. Dr. E. H. Christopherson, 610 Church St., Evanston, Ill., Secretary.

AMERICAN ASSOCIATION OF BLOOD BANKS, LaSalle Hotel, Chicago, Oct. 17-20. Miss Marjorie Saunders, 3500 Gaston Ave., Dallas 4, Texas, Secretary.

AMERICAN ASSOCIATION OF MEDICAL CLINICS, Congress Hotel, Chicago, Oct. 9-11. Dr. Edwin P. Jordan, P. O. Box 114, Charlottesville, Va., Executive Director.

AMERICAN ASSOCIATION OF MEDICAL RECORD LIBRARIANS, Palace Hotel, San Francisco, Oct. 5-9. Miss Doris Gleason, 510 N. Dearborn St., Chicago 10, Executive Secretary.

AMERICAN ASSOCIATION FOR THE SURGERY OF TRAUMA, Drake Hotel, Chicago, Oct. 1-3. Dr. James K. Stack, 700 North Michigan Blvd., Chicago, Secretary.

AMERICAN CANCER SOCIETY, New York, Nov. 2-6. Dr. Charles S. Cameron, 47 Beaver St., New York 4, Medical Director.

AMERICAN CLINICAL AND CLIMATOLOGICAL ASSOCIATION, The Homestead, Hot Springs, Va., Nov. 2-4. Dr. Marshall N. Fulton, 124 Waterman St., Providence 6, R. I., Secretary.

AMERICAN COLLEGE OF SURGEONS, Conrad Hilton Hotel, Chicago, Oct. 5-9. Dr. Michael L. Mason, 40 East Erie St., Chicago, Secretary.

AMERICAN DENTAL ASSOCIATION, Cleveland, Sept. 28-Oct. 1. Dr. Harold Hillenbrand, 222 E. Superior St., Chicago 11, General Secretary.

AMERICAN FRACTURE ASSOCIATION, Mission Inn, Riverside, Calif., Oct. 12-15 Dr. H. W. Wellmerling, 120 S. LaSalle St., Chicago 3, Secretary.

AMERICAN MEDICAL WRITERS' ASSOCIATION, Elk's Club, Springfield, Ill., Sept. 23. Dr. Harold Swanberg, 510 Maine St., Quincy, Ill., Secretary.

AMERICAN ROENTGEN RAY SOCIETY, Netherland Plaza, Cincinnati, Sept. 29-Oct. 2. Dr. Barton R. Young, Germantown Hospital, Philadelphia 44, Secretary.

AMERICAN SOCIETY OF ANESTHESIOLOGISTS, Olympic Hotel, Seattle, Oct. 6-9. Dr. J. Earl Remlinger Jr., Room 1101, 188 W. Randolph St., Chicago, Secretary.

AMERICAN SOCIETY OF CLINICAL PATHOLOGISTS, Drake Hotel, Chicago, Oct. 12-16. Dr. Clyde G. Culbertson, 1040 W. Michigan St., Indianapolis, Secretary.

AMERICAN SOCIETY FOR THE STUDY OF ARTERIOSCLEROSIS, Hotel Knickerbocker, Chicago, Nov. 1-2. Dr. O. J. Pollak, P. O. Box 228, Dover, Del., Secretary.

ASSOCIATION OF AMERICAN MEDICAL COLLEGES, Hotel Claridge, Atlantic City, N. J., Oct. 26-28. Dr. Dean F. Smiley, 185 N. Wabash Ave., Chicago 1, Secretary.

ASSOCIATION OF LIFE INSURANCE MEDICAL DIRECTORS OF AMERICA, Hotel Statler, New York, Oct. 14-16. Dr. Henry B. Kirkland, P. O. Box 594, Newark 1, N. J., Secretary.

ASSOCIATION OF MEDICAL ILLUSTRATORS, Sheraton Hotel, Baltimore, Oct. 5-7. Miss Evelyn J. Erickson, 1512 St. Antoine St., Detroit 26, Secretary.

ASSOCIATION OF STATE AND TERRITORIAL HEALTH OFFICERS, Washington Hotel, Washington, D. C., Nov. 4-7. Dr. John D. Porterfield, 306 Ohio Depts. Bldg., Columbus 15, Ohio, Secretary.

CENTRAL ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS, The Shamrock, Houston, Texas, Nov. 5-7. Dr. Harold L. Gainey, Suite 602, 116 South Michigan Ave., Chicago 3, Secretary.

CENTRAL NEUROPSYCHIATRIC ASSOCIATION, Claypool Hotel, Indianapolis, Oct. 15-17. Dr. Hamilton Ford, 112 North Blvd., Galveston, Texas, Secretary.

COLLEGE OF AMERICAN PATHOLOGISTS, Drake Hotel, Chicago, Oct. 12-16. Dr. Harry P. Smith, 203 N. Wabash Ave., Chicago 1, Secretary.

COLORADO STATE MEDICAL SOCIETY, Shirley-Savoy Hotel, Denver, Sept. 29-Oct. 2. Mr. Harvey T. Stethman, 835 Republic Bldg., Denver 2, Executive Secretary.

CONSTANTINIAN SOCIETY, Battery Park Hotel, Asheville, N. C., Oct. 18-21. Dr. C. F. Shook, Medical Director, Owens-Illinois Glass Company, Toledo 1, Ohio, Secretary.

DELAWARE, MEDICAL SOCIETY OF, Hotel du Pont, Wilmington, Oct. 12-14. Dr. Andrew M. Gehret, 822 North American Bldg., Secretary.

DISTRICT OF COLUMBIA, MEDICAL SOCIETY OF THE, Hotel Statler, Washington, Oct. 5-7. Mr. Theodore Wiprud, 1718 M St. N.W., Washington 6, Secretary.

GULF COAST CLINICAL SOCIETY, Admiral Semmes Hotel, Mobile, Ala., Oct. 15-16. Dr. William J. Atkinson Jr., 1217 Government St., Mobile 20, Ala., Secretary.

GULF COAST CONFERENCE ON INDUSTRIAL HEALTH, Shamrock Hotel, Houston, Tex., Oct. 1-3. Dr. Sidney Schnur, 411 Medical Arts Bldg., Houston 2, Tex., Co-Chairman.

INDIANA STATE MEDICAL ASSOCIATION, French Lick, Oct. 19-21. Mr. James A. Waggener, 23 E. Ohio St., Indianapolis 4, Executive Secretary.

INTERSTATE POST GRADUATE MEDICAL ASSOCIATION OF NORTH AMERICA, Palmer House, Chicago, Nov. 2-5. Dr. E. R. Schmidt, 1300 University Ave., Madison 5, Wisconsin, Secretary.

KANSAS CITY SOUTHWEST CLINICAL SOCIETY, Kansas City, Mo., Sept. 28-Oct. 1. Dr. W. H. Algie, 825 North 7th Street, Kansas City, Kans., Secretary.

KENTUCKY STATE MEDICAL ASSOCIATION, Brown Hotel, Louisville, Sept. 22-24. Dr. Bruce Underwood, 620 South Third St., Louisville 2, Secretary.

MICHIGAN STATE MEDICAL SOCIETY, Pantlind Hotel and Civic Auditorium, Grand Rapids, Sept. 23-25. Dr. L. Fernald Foster, 606 Townsend St., Lansing 15, Secretary.

MIDWESTERN SECTION OF AMERICAN FEDERATION FOR CLINICAL RESEARCH, Congress Hotel, Chicago, Oct. 29. Dr. Robert J. Glaser, 600 S. Kingshighway Blvd., St. Louis 10, Secretary.

MISSISSIPPI VALLEY MEDICAL SOCIETY, Springfield, Ill., Sept. 23-25. Dr. Harold Swanberg, 510 Maine St., Quincy, Ill., Secretary.

MONTANA MEDICAL ASSOCIATION, Northern Hotel, Billings, Sept. 17-20. Mr. L. R Hegland, 104 North Broadway, Billings, Executive Secretary.

NATIONAL GASTROENTEROLOGICAL ASSOCIATION, Hotel Biltmore, Los Angeles, Oct. 12-17. Dr. A. Xerxes Rossien, 1819 Broadway, New York 23, Secretary.

NATIONAL PROCTOLOGIC ASSOCIATION, Congress Hotel, Chicago, Oct. 15-17. Dr. George E. Mueller, 59 East Madison St., Chicago 2, Secretary.

NEUROSURGICAL SOCIETY OF AMERICA, The Broadmoor, Colorado Springs, Colo., Sept. 23-27. Dr. C. D. Hawkes, 22 North Manassas St., Memphis 5, Tenn., Secretary.

NEVADA STATE MEDICAL ASSOCIATION, Carter Hotel, Elko, Sept. 24-26. Dr. William A. O'Brien III, 505 Chestnut St., Reno, Secretary.

NEW ENGLAND OBSTETRICAL AND GYNECOLOGICAL SOCIETY, Hotel Somerset, Boston, Oct. 28. Dr. Carmi R. Alden, 270 Commonwealth Ave., Boston, Secretary.

NEW HAMPSHIRE MEDICAL SOCIETY, Equinox House, Manchester, Vt., Oct. 4-6. Dr. Deering G. Smith, 44 Chester St., Nashua, Secretary.

NORTH PACIFIC SOCIETY OF INTERNAL MEDICINE, Harrison, B. C., Canada, Sept. 18-19. Dr. Clarence C. Pearson, 1115 Terry Ave., Seattle 1, Wash., Secretary.

NORTH TEXAS-SOUTHERN OKLAHOMA FALL CLINICAL CONFERENCE, Wichita Falls, Texas, Sept. 16. Dr. C. H. Wilson, 1300 Eighth St., Wichita Falls, Texas, Secretary.

OKLAHOMA CITY CLINICAL SOCIETY, Oklahoma City, Oct. 26-29. Miss Alma F. O'Donnell, 512 Medical Arts Bldg., Oklahoma City 2, Executive Secretary

OMAHA MID-WEST CLINICAL SOCIETY, Hotel Paxton, Omaha, Oct. 26-30. Miss Irene Rau, 1031 Medical Arts Bldg., Omaha 2, Executive Secretary.

OREGON STATE MEDICAL SOCIETY, Heathman Hotel, Portland, Oct. 14-17. Dr. Charles E. Littlehales, 833 S.W. Eleventh Ave., Portland 5, Secretary.

PENNSYLVANIA, MEDICAL SOCIETY OF THE STATE OF, William Penn Hotel, Pittsburgh, Sept. 21-24. Dr. Harold B. Gardner, 230 State St., Harrisburg, Secretary.

REGIONAL MEETINGS, AMERICAN COLLEGE OF PHYSICIANS:

ARKANSAS-OKLAHOMA, Tulsa, Okla., Sept. 19. Dr. Wann Langston, 117 North Broadway, Oklahoma City 2, Governor.

WESTERN NEW YORK, Syracuse, Oct. 9. Dr. E. C. Reifenstein, 109 South Warren St., Syracuse 2, Governor.

OHIO, Dayton, Oct. 9. Dr. Charles A. Doan, Ohio State University College of Medicine, Columbus 10, Governor.

MONTANA-WYOMING, Missoula, Mont., Oct. 9-10. Dr. Harold W. Gregg, 127 West Park Street, Butte, Mont., Governor.

NEW ENGLAND—CONN., MAINE, MASS., N. H., R. I., VT.—Hartford, Conn., Oct. 28. Dr. John C. Leonard, 80 Seymour St., Hartford 15, Conn., Chairman.

NEW JERSEY, Trenton, Nov. 4. Dr. Edward C. Klein Jr., 73 Lincoln Park, Newark 2, Governor.

SOUTHEASTERN—Cuba, Alabama, Florida, Georgia, South Carolina—St. Simons, Sea Island, Ga., Oct. 16-17. Dr. Carter Smith, 384 Peachtree St. N.E., Atlanta 3, Ga., Chairman.

SOUTH CENTRAL BRANCH, AMERICAN UROLOGICAL ASSOCIATION, Kansas City, Mo., Sept. 20-23. Dr. Rex E. Van Duzen, 721 Medical Arts Bldg., Dallas, Texas, Chairman.

SOUTHERN MEDICAL ASSOCIATION, Municipal Auditorium, Atlanta, Ga., Oct. 26-29. Mr. C. P. Loranz, 1020 Empire Bldg., Birmingham 3, Ala., Secretary.

SOUTHERN MINNESOTA MEDICAL ASSOCIATION, St. John's Catholic School, Mankato, Sept. 14. Dr. C. F. Stroebel, 102 Second Ave. S. W., Rochester, Secretary.

SOUTHWESTERN MEDICAL ASSOCIATION, El Conquistador Hotel, Tucson, Ariz., Oct. 29-31. Dr. C. C. Stapp, 800 Montana St., El Paso, Texas, Secretary.

SOUTHWESTERN SURGICAL CONGRESS, Hotel Utah, Salt Lake City, Sept. 21-23. Dr. C. R. Rountree, 1227 Classen St., Oklahoma City 3, Secretary.

TENNESSEE VALLEY MEDICAL ASSEMBLY, Read House Hotel, Chattanooga, Sept. 28-29. Dr. William G. Stephenson, 612 Medical Arts Bldg., Chattanooga 3, President.

U. S. CHAPTER, INTERNATIONAL COLLEGE OF SURGEONS, Waldorf-Astoria, New York, Sept. 13-17. Dr. Karl Meyer, 1516 Lake Shore Drive, Chicago 10, Secretary.

VERMONT STATE MEDICAL SOCIETY, Equinox House, Manchester, Oct. 4-6. Dr. James P. Hammond, 542 Main St., Bennington, Secretary.

VIRGINIA, MEDICAL SOCIETY OF, Hotel Roanoke, Roanoke, Oct. 18-21. Mr. Robert I. Howard, 1105 W. Franklin St., Richmond 20, Executive Secretary.

WASHINGTON STATE MEDICAL ASSOCIATION, Olympic Hotel, Seattle, Sept. 13-16. Dr. Bruce Zimmerman, 338 White-Henry-Stuart Bldg., Seattle 1, Secretary.

WESTERN ORTHOPEDIC ASSOCIATION, Sun Valley, Idaho, Oct. 5-8. Dr. Forrest L. Flashman, 1301 Spring St., Seattle 4, Secretary.

WISCONSIN, STATE MEDICAL SOCIETY OF, Hotel Schroeder, Milwaukee, Oct. 5-8. Mr. Charles H. Crownhart, 704 East Gorham St., Madison 3, Secretary.

FOREIGN

ASSOCIATION OF SURGEONS OF GREAT BRITAIN AND IRELAND, Leeds, England, May 13-15, 1954. Dr. Henry W. S. Wright, 45 Lincoln's Inn Fields, London W.C.2, England, Honorary Secretary.

CANADIAN MEDICAL ASSOCIATION, Vancouver, B. C., Canada, June 18-22, 1954. Dr. T. C. Routley, 135 St. Clair Ave. W., Toronto 5, Ont., Canada, General Secretary.

CONGRESS OF INTERNATIONAL ANESTHESIA RESEARCH SOCIETY, Chateau Frontenac, Quebec, Canada, October 26-29. Dr. A. William Friend, 515 Nome Ave., Akron 20, Ohio, Chairman, Program Committee.

CONGRESS OF THE INTERNATIONAL SOCIETY OF ANGIOLOGY, Lisbon, Portugal, Sept. 18-20. Dr. Henry Haimovici, 105 East 90th St., New York 28, N. Y., U. S. A., Secretary.

CONGRESS OF THE INTERNATIONAL SOCIETY OF SURGERY, Lisbon, Portugal, Sept. 14-20. Dr. L. Dejardin, 141, rue Belliard, Brussels, Belgium, General Secretary.

INTERIM MEETING, AERO MEDICAL ASSOCIATION, University of Brussels Medical School, Brussels, Belgium, Sept. 24-27. Dr. Andre Allard, Medical Director of SABENA, 145 Rue Royale, Brussels, Belgium, Secretary.

INTERNATIONAL CANCER CONGRESS, Sao Paulo, Brazil, July 23-29, 1954. Prof. A. Prudente, 171 rua Benjamin Constante, Sao Paulo, Brazil, President.

INTERNATIONAL CONFERENCE ON THROMBOSIS AND EMBOLISM, Basle, Switzerland, July 15-19, 1954 Dr. W. Merz, Chief Medical Officer, Gynecological Clinic, University of Basle, Basle, Switzerland, Hon. Secretary.

INTERNATIONAL CONGRESS ON GROUP PSYCHOTHERAPY, Toronto, Ont., Canada, Aug. 12-14, 1954. Dr. J. L. Moreno, Room 327, 101 Park Ave., New York 17, N. Y., U. S. A., Director of Organizing Committee.

INTERNATIONAL CONGRESS OF HYDROCLIMATISM AND THALASSOTHERAPY, Dubrovnik, Yugoslavia, May 8-16, 1954. Prof. C. Plavsic, Zeleni Venac 1, Belgrade, Yugoslavia, Secretary General.

INTERNATIONAL CONGRESS OF INTERNATIONAL COLLEGE OF SURGEONS, Sao Paulo, Brazil, April 26-May 2, 1954. Dr. Max Thorek, 1516 Lake Shore Drive, Chicago, Illinois, U.S.A., Secretary-General.

INTERNATIONAL CONGRESS ON MENTAL HEALTH, University of Toronto, Toronto, Ontario, Canada, Aug. 14-21, 1954. For information write: Executive Officer, International Congress on Mental Health, 111 St. George St., Toronto, Ontario, Canada.

INTERNATIONAL CONGRESS ON OBSTETRICS AND GYNECOLOGY, Geneva, Switzerland, July 26-31, 1954. Dr. H. de Watteville, Maternité Hôpital Cantonal, Geneva, Switzerland, President.

INTERNATIONAL CONGRESS OF PAEDIATRICS, Havana, Cuba, Oct. 12-17. Prof. Felix Hurtado, 5a Avenue 124, Miramar, Havana, Cuba President.

INTERNATIONAL CONGRESS OF PSYCHOLOGY, Montreal, Canada, June 7-12, 1954. For information write: Prof. H. S. Langfeld, International Union of Scientific Psychology, Eno Hall, Princeton University, Princeton, N. J., U. S. A.

INTERNATIONAL CONGRESS FOR PSYCHOTHERAPY, Zurich, Switzerland, July 21-24, 1954. Dr. H. K. Fierz, Theaterstrasse 12, Zurich 1, Switzerland, Secretary General.

INTERNATIONAL GERONTOLOGICAL CONGRESS, London and Oxford, England, July 12-22, 1954. Prof. R. E. Tunbridge, General Infirmary, Department of Medicine, The University, Leeds, England, President.

INTERNATIONAL LEPROSY CONGRESS, Madrid, Spain, Oct. 3-10. Dr. Felix Contreras, Moreto 15, Madrid, Spain, Secretary.

INTERNATIONAL OFFICE OF DOCUMENTATION OF MILITARY MEDICINE, Rome, Italy, Oct. 14-18. Colonel Medecin Prof. A. Campana, Office of the Ministero della Difesa-Esercito, Rome, Italy, Secretary.

INTERNATIONAL SOCIETY FOR THE STUDY OF BIOLOGICAL RHYTHMS, Basle, Switzerland, Sept. 18-19. For information write: Prof. Dr. F. Georgi, Neurologische Universitats-Poliklinik, Socinstrasse 55, Basle, Switzerland.

JOURNEES MEDICALES, Paris, France, April 21-25, 1954. For information write: Secretariat of the Journees, 12, rue Pierre-Geofroix, Colombes (Seine) France.

LATIN AMERICAN CONGRESS OF OBSTETRICS AND GYNECOLOGY, Buenos Aires, Argentina, Oct. 26-31.

LATIN AMERICAN CONGRESS OF OTORHINOLARYNGOLOGY, Caracas, Venezuela, Feb. 21-25, 1954. Dr. Victorino Marquez Reveron, Centro Medico, Caracas, Venezuela, Secretary-General.

PACIFIC SCIENCE CONGRESS, Quezon City and Manila, Philippines, Nov. 16-28. Dr. Patrocinio Valenzuela, College of Pharmacy, University of the Philippines, Quezon City, Philippines, Secretary-General.

PAN AMERICAN CONGRESS OF OTORHINOLARYNGOLOGY AND BRONCHOESOPHAGOLOGY, Mexico, D.F., Mexico, Feb. 28-March 4, 1954.

PAN AMERICAN MEDICAL ASSOCIATION, International Medical Cruise Congress, S. S. Nieuw Amsterdam, Jan. 6-22, 1954. Dr. Joseph J. Eller, 745 Fifth Avenue, New York 22, N. Y., U. S. A., Executive Director.

PAN AMERICAN MEDICAL WOMEN'S ALLIANCE, Beekman Towers Hotel, New York, N. Y., Sept. 24-Oct. 1. Dr. Ina Marsh, 140 Linwood Ave., Buffalo, N. Y., U. S. A., Registration Chairman.

PERSIAN GULF MEDICAL SOCIETY, Dhahran, Saudi Arabia, Dec. 7-8. Dr. N. J. Conan Jr., Department of Internal Medicine, Arabian American Oil Company, Dhahran, Saudi Arabia, Secretary.

REGIONAL MEETING, AMERICAN COLLEGE OF PHYSICIANS, San Juan, Puerto Rico, Oct. 15-17. Dr. R. Rodriquez-Molina, Veterans Administration Center, San Juan, Puerto Rico, Governor.

SECTIONAL MEETING, AMERICAN COLLEGE OF SURGEONS, London, England, May 17-19, 1954. Dr. Michael L. Mason, 40 East Erie St., Chicago 11, Ill., U. S. A., Secretary.

EXAMINATIONS AND LICENSURE

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: *Parts I and II.* All centers where there are five or more candidates. Sept. 8-10 (Part I only). Candidates may file applications at any time, but the National Board must receive them at least six weeks before the date of the examination they wish to take. Exec. Sec., Dr. John P. Hubbard, 133 South 36th St., Philadelphia 4.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Written.* Various Centers, July 16, 1954. Sec., Dr. Curtiss B. Hickox, 80 Seymour St., Hartford 15.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: All candidates must now pass a written examination. *Oral.* Philadelphia, Oct. 16-18. To be eligible, candidate must complete 36 months of training before Oct. 1. Final date for filing applications was May 1. Exec. Sec., Miss Janet Newkirk, 66 East 66th St., New York 21.

AMERICAN BOARD OF INTERNAL MEDICINE: *Oral.* San Francisco, Sept. 30-Oct. 2, Chicago, Nov. 30-Dec. 2. The closing date for acceptance of applications for the San Francisco and Chicago oral examination was April 1. *Written.* October 19. The closing date for acceptance of applications was May 1. Exec. Sec.-Treas., Dr. William A. Werrell, 1 West Main St., Madison 3.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: *Oral.* New Haven, October. Final date for filing application was July 1, Sec., Dr. Leonard T. Furlow, Washington University School of Medicine, Kingshighway and Euclid Ave., St. Louis.

AMERICAN BOARD OF NEUROLOGY AND PSYCHIATRY: *Psychiatry and Neurology.* Dec. 14-15. Applications no longer being accepted Chicago, April 29-30. Final date for filing application is Feb. 1. Sec., Dr. David A. Boyd, Jr., 102-110 Second Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written.* Various cities of the United States and Canada, Feb. 5. Application for examination or re-examination, as well as requests for resubmission of case reports, must be made prior to October 1. Sec., Dr. Robert L. Faulkner, 2105 Adelbert Road, Cleveland 6.

AMERICAN BOARD OF OPHTHALMOLOGY: Chicago, Oct. 5-9. *Written.* Various Centers, January 1954. Final date for filing applications was July 1. Sec., Dr. Edwin B. Dunphy, 56 Ivie Road, Cape Cottage, Maine.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: *Part II.* Chicago, Jan. 20-22. Final date for filing application was August 15. Final date for filing application for Part I is Nov. 30. Sec., Dr. Harold A. Sofield, 122 S. Michigan Ave., Chicago 3.

AMERICAN BOARD OF OTOLARYNGOLOGY: *Oral.* Chicago, Oct. 5-9. Sec., Dr. Dean M. Lierle, University Hospital, Iowa City.

AMERICAN BOARD OF PATHOLOGY: *Written. Pathologic Anatomy and Clinical Pathology.* Chicago, Oct. 8-10. Sec., Dr. William B. Wartman, 303 E. Chicago Ave., Chicago.

AMERICAN BOARD OF PEDIATRICS: *Oral.* Miami, Oct. 9-11; Indianapolis, Dec. 4-6. Exec. Sec., Dr. John McK. Mitchell, 6 Cushman Road, Rosemont, Pa.

AMERICAN BOARD OF PLASTIC SURGERY: *Entire Examination.* San Diego, Oct. 29-31. Final date for receipt of case reports was June 1. Corres. Sec., Mrs. Estelle E. Hillerich, 4647 Pershing Ave., St. Louis 8.

AMERICAN BOARD OF PROCTOLOGY: *Part II. Oral and Written. Anorectal Surgery and Proctology.* Philadelphia, Sept. 19. Sec., Dr. Louis A. Buie, 102-110 Second Ave. S.W., Rochester, Minn.

AMERICAN BOARD OF RADIOLOGY: *Oral. Radiology, Roentgenology, Diagnostic Roentgenology and Therapeutic Radiology.* Chicago, Dec. 6-11. Final date for filing application was July 1. Sec., Dr. B. R. Kirklin, 102-110 Second Ave. S.W., Rochester, Minn.

AMERICAN BOARD OF SURGERY: *Part I.* Oct. 28, 1953. March 31, 1954 and Oct. 27, 1954. *Part II.* New York City, Oct. 12-13; Chicago, Nov. 9-10; St. Louis, Dec. 14-15; Los Angeles, Jan. 11-12, 1954; Galveston, Jan. 15-16; Washington, Feb. 8-9; Cincinnati, March 8-9; New Orleans, April 12-13; Philadelphia, May 10-11; Boston, June 14-15. Sec., Dr. John B. Flick, 225 S. 15th St., Philadelphia 2.

BOARD OF THORACIC SURGERY: *Written.* Various centers throughout the country, September 11. Final date for filing application was July 1. Sec., Dr. William M. Tuttle, 1151 Taylor Ave., Detroit 2.

DEATHS

Metz, Waldemar Rice ⊕ New Orleans; born in New Orleans in 1891; Tulane University of Louisiana School of Medicine, New Orleans, 1913; clinical associate professor of surgery, Louisiana State University School of Medicine; specialist certified by the American Board of Plastic Surgery; member of the Southeastern Surgical Congress and the American Society of Plastic and Reconstructive Surgery; fellow of the American College of Surgeons; past president and vice-president of the Orleans Parish Medical Society; one of the founders, member of the board, and past president of the New Orleans Graduate Medical Assembly; served during World War I; plastic surgeon for the crippled children's division, state board of health; formerly associated with the U. S. Public Health Service; consultant plastic surgeon, U. S. Public Health Service Hospital, Carville, La.; attending plastic surgeon, U. S. Public Health Service Hospital; member of the staffs of Southern Baptist Hospital, Mercy Hospital-Soniat Memorial, Sara Mayo Hospital, Charity Hospital of Louisiana, and Touro Infirmary, where he died July 10, aged 62, of cerebral embolism with massive infarction of left cerebral hemisphere.

Walker, Alfred Augustus ⊕ Birmingham, Ala.; born in 1881; Cornell University Medical College, New York, 1905; emeritus professor of pediatrics at Medical College of Alabama; member of the House of Delegates of the American Medical Association from 1924 to 1926, in 1930, from 1934 to 1945, and in 1948, a member of its Council on Scientific Assembly from 1935 to 1945, serving as chairman of the council from 1942 to 1945, and secretary of the Section on Diseases of Children from 1930 to 1933 and chairman, 1933-1934, for many years chairman of the Jefferson County Board of Health; a director of the American Board of Pediatrics from 1934 to 1944; member of the American Academy of Pediatrics; served during World War I; affiliated with Children's Hospital, St. Vincent's Hospital, and Jefferson-Hillman Hospital; consultant in pediatrics at South Highlands Infirmary; died in St. Vincent's Hospital July 7, aged 72, of congestive heart failure, myocardial infarction, and arteriosclerosis.

Griffith, William Allen, Berwyn, Md.; College of Physicians and Surgeons, Baltimore, 1909; at one time physician at the University of Maryland in College Park; served during World War I; past president of the Prince Georges County Medical Society, Southern Maryland Medical Society, and the state board of medical examiners; formerly director of Prince Georges Bank and Trust Company; for 34 years local physician for the Baltimore and Ohio Railroad; on the staff of Leland Memorial Hospital in Riverdale, where he died June 16, aged 72, of cerebral hemorrhage.

Ball, Otho Fisher ⊕ Chicago; St. Louis College of Physicians and Surgeons, 1897; member of the American College of Hospital Administrators; president of the Modern Hospital Publishing Company, publishers of *Modern Hospital;* died July 19, aged 78, of coronary occlusion.

Best, Alonzo Lee, Newport, Ark.; Memphis (Tenn.) Hospital Medical College, 1901; died July 11, aged 78.

Bollmeier, Ludolf Nicholas ⊕ Hot Springs National Park, Ark.; St. Louis College of Physicians and Surgeons, 1921; Kansas City (Mo.) College of Medicine and Surgery, 1922; member of the American Psychoanalytic Association, American Psychosomatic Society, American Psychiatric Association, and the Association for Research in Nervous and Mental Diseases; consultant at Veterans Administration Hospital in North Little Rock; died in St. Joseph's Infirmary July 6, aged 54, of acute coronary occlusion.

Brown, Frederick Willard, Dwight, Ill.; Chicago College of Medicine and Surgery, 1911; died in Veterans Administration Hospital July 12, aged 71.

⊕ Indicates Member of the American Medical Association.

Crowe, John William ⊕ Washington, D. C.; Georgetown University School of Medicine, Washington, 1897; died in Montgomery County, Md., July 18, aged 85, of generalized arteriosclerosis.

Downing, Perley Edwin, Trenton, N. J.; New York Homeopathic Medical College and Flower Hospital, New York, 1914; senior resident physician, New Jersey State Hospital; died in Tremont, Pa., July 12, aged 67, of cerebral thrombosis.

Foster, Herbert West ⊕ Montclair, N. J.; New York Homeopathic Medical College and Hospital, New York, 1891; an Associate Fellow of the American Medical Association; founder and first president of the Associated Physicians of Montclair and Vicinity; served on the staffs of the Mountainside and Montclair Community hospitals; died July 13, aged 83, of pneumonia and emphysema.

Heil, Ulysses S. Grant, Easton, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1889; died in Betts Hospital July 17, aged 85.

Lewis, Margaret C., Honey Brook, Pa.; Woman's Medical College of Pennsylvania, Philadelphia, 1895; died in West Chester, July 13, aged 84, of cerebral hemorrhage.

McCastline, William Henry ⊕ Brandon, Vt.; Columbia University College of Physicians and Surgeons, New York, 1903; member of the Medical Society of the State of New York; for many years medical officer at Columbia University; died July 11, aged 77, of coronary thrombosis.

Milligan, Leo Patrick, Huntsville, Ala.; Georgetown University School of Medicine, Washington, D. C., 1911; died July 8, aged 69, of cerebral hemorrhage.

Murphy, Eugene Clement ⊕ Philadelphia; Medico-Chirurgical College of Philadelphia, 1913; fellow of the American College of Surgeons; served in France during World War I; formerly affiliated with the U. S. Public Health Service; on the staff of the Doctors Hospital, of which he was one of the founders, and St. Agnes Hospital; died July 9, aged 62, of pulmonary tuberculosis.

Palay, Lewis, Miami Beach, Fla.; University of Louisville (Ky.) School of Medicine, 1928; certified by the National Board of Medical Examiners; specialist certified by the American Board of Otolaryngology; member of the American College of Allergists; affiliated with Mount Sinai Hospital, where he died July 17, aged 51, of coronary thrombosis and myocardial infarction.

Pascall, Thomas Myrick ⊕ Newark, N. J.; Baltimore Medical College, 1906; member of the Industrial Medical Association; died in Hospital of St. Barnabas and for Women and Children July 17, aged 72, of cerebral thrombosis.

Peeler, Crawford Monroe ⊕ Pangburn, Ark.; University of Nashville Medical Department, 1909; past president of the White County Medical Society; served as mayor of Pangburn; died in Searcy July 7, aged 72, of coronary occlusion.

Plumlee, Claude Hamilton, Celina, Tenn.; University of Tennessee College of Medicine, Memphis, 1952; interned at John Gaston Hospital at Memphis; died July 5, aged 30, of injuries received in an automobile accident.

Purvey, John Compton ⊕ Crystal Lake, Ill.; University of Illinois College of Medicine, Chicago, 1939; served during World War II; affiliated with St. Joseph and Sherman hospitals in Elgin, and the Memorial Hospital in Woodstock; died in Augustana Hospital, Chicago, July 14, aged 39, of subdural hemorrhage.

Roberts, David William, Okemos, Mich.; Cleveland University of Medicine and Surgery, 1897; affiliated with Edward W. Sparrow Hospital in Lansing; for many years medical director of the Ingham County Hospital; died July 29, aged 87, of cerebral hemorrhage.

GOVERNMENT SERVICES

ARMY

Regular Army Physicians May Now Resign.—Regular officers of the Army Medical Service may resign and leave the service under a new and more liberal Department of the Army policy, according to Major Gen. Siles B. Hays, Acting Surgeon General. Beginning with officers having the longest periods of service, a number will be allowed to resign each month, on recommendation of the Surgeon General, provided they have met certain service requirements. Previously, resignations were accepted only in cases of extreme hardship. According to the new policy, regular officers who have no obligatory commitments to the Army and who have served in the Regular Army for a period of three years are eligible for release. If, however, they have served for less than eight years, they must accept commissions in the Reserve.

"Even though we expect to lose some officers in the next few months," General Hays said, "we believe the new policy will encourage physicians to enter the Regular Army because they will no longer be required to commit themselves to an indefinite term of service. Actually, I believe that our increasing percentage of officers will find the military service so stimulating professionally and so pleasant that they will make it their career."

NAVY

Medical and Dental Symposium.—The third medical and dental military symposium under the auspices of the First Naval District will be held at the Naval Hospital, Chelsea, Mass., October 12-14. Civilian physicians, dentists, and members of allied sciences, in addition to those of the armed forces, are invited to attend. The subjects will be presented by speakers of outstanding prominence in their specialties.

The Chief of Naval Personnel has approved the symposium for retirement point credit for Reservists not on the Inactive Status List. One retirement point credit will be awarded for each of the three sessions attended providing the duration of the meeting is at least two hours. Requests for duty orders should be submitted to the Commandant of the First Naval District.

PUBLIC HEALTH SERVICE

Conference of Foreign Health Workers.—About 85 foreign health workers who have received postgraduate training in the United States through the assistance of the Division of International Health, Public Health Service, met in Washington August 17-21 for an evaluation seminar. During the week-long conference, the group had an opportunity to discuss their experiences in the nine months of academic training and three months of field training just completed. The trainees, who have been studying public health, nursing education, public health nursing, sanitary engineering, and various clinical fields, represent 20 different countries: Thailand, Burma, India, Brazil, Colombia, Costa Rica, Finland, Germany, Greece, Honduras, Indonesia, Iraq, Lebanon, Mexico, Panama, Philippine Islands, Taiwan, Uruguay, and Vietnam. The students carried out their work in the United States under the sponsorship primarily of the Technical Cooperation Administration, the Mutual Security Agency, and the Office of the High Commissioner of Germany. They were placed by the Division of International Health in 28 universities, hospitals, and laboratories throughout the country.

Applications for Hospital Construction.—By the end of June 30, 1953, a total of 2,104 applications for hospital construction had been approved under the terms of the Hill-Burton Act, according to the Division of Hospital Facilities, Public Health Service. More than 1,200 of the projects are open and in operation, 727 are under construction, and the remaining are in preconstruction stages. These projects will add 102,362 hospital beds and 413 health centers to the nation's health facilities at a cost of more than one and two-thirds billion dollars. The federal government is contributing over 500 million dollars and the sponsors more than one billion dollars. The majority of all approved applications (71%) are for general hospital projects; 4% are for mental hospitals, 3% for tuberculosis hospitals, and 2% for chronic disease facilities. Of the total projects, 1,242, or 59%, are completely new facilities; additions or alterations to existing facilities comprise the remaining 41%.

Water Pollution Control.—The nation's municipalities invested about 31 million dollars in water pollution control projects during the first quarter of 1953, the Public Health Service has announced. Contracts were awarded for 119 sewage treatment projects designed to keep harmful wastes out of rivers, lakes, and other waterways. Of these, 61 were for construction of new sewage treatment plants, 48 for enlargement or improvement of existing plants, and 10 for construction of interceptor sewers. Dr. Leonard A. Scheele, Surgeon General of the Public Health Service, said the 31 million dollar investment represents a slight increase over last year's expenditures for the comparable period but is far below the amount needed to conserve the nation's clean water resources. Many more cities and towns need to follow the example of these 119 municipalities in solving their own local problems, if the total national problem is to be solved.

Personal.—Dr. Stanley E. Krumbiegel has been appointed medical officer in charge of the U. S. Public Health Service Outpatient Clinic at Washington, D. C., to succeed Dr. Clifton K. Himmelsbach, recently assigned as assistant chief, division of hospitals, Public Health Service. In his new position, Dr. Krumbiegel, who since 1948 has been medical director of the Bureau of Prisons, Department of Justice, will be responsible for the administration of the medical care program for beneficiaries of the Public Health Service in the Washington area. Dr. Harold M. Janney, who since 1950 has been medical director of the U. S. Penitentiary, Atlanta, Ga., has been appointed medical director of the Bureau of Prisons. The Public Health Service administers the medical care, health, and hospital activities in federal penal and correctional institutions.

VETERANS ADMINISTRATION

New Hospital Managers.—The Veterans Administration has announced the appointment of managers for the VA neuropsychiatric hospitals at Danville, Ill., and Roseburg, Ore. Dr. Oreon K. Timm, chief of professional services at the 1,700-bed Danville hospital, will become manager of that institution, succeeding Dr. L. E. Trent who is retiring Sept. 30, 1953. Dr. George L. Wadsworth, chief of professional services at the VA Hospital in Tomah, Wis., will become manager of the 577-bed hospital at Roseburg, succeeding Dr. John L. Haskins, who has been transferred to the VA center at Los Angeles. Dr. Glen W. Doolen, chief of plans and development in the tuberculosis division of the department of medicine and surgery, Washington, D. C., has been appointed manager of the VA Hospital at Richmond, Va. He will succeed Dr. John G. Hood, who has been transferred to the VA Hospital, Bronx, N. Y., where he will be manager.

FOREIGN LETTERS

ARGENTINA

Chagas' Disease.—The American human trypanosomiasis caused by Trypanosoma cruzi was discovered by Carlos Chagas in Brazil. For some time, the importance of the disease was minimized, but Salvador Mazza, in Argentina, demonstrated that the disease is endemic over wide areas. The importance of the chronic myocardial diseases was recognized by Mazza (province of Jujuy) and by Cecilio Romaña (province of Tucumán). The diagnosis of acute cases was facilitated by the recognition of an unilateral palpebral edema (Romaña sign). The diagnosis is established by three methods: (1) direct examination of a thick drop of blood; (2) by xenodiagnosis, with blood secured in the suspected case by triatomas bred in the laboratory free of crithidias; and (3) by the Machado-Guerrero seroreaction.

The disease is transmitted by the bite of Triatoma infestans, which is usually found in rural houses. The Triatomas are found from Patagonia (Argentina) to the southern United States. Triatoma infestans, the principal vector in Argentina, is infected by Trypanosoma cruzi in large but variable proportions. The proportion of children infected is from 6 to 40%, and it is believed that 15 to 20% of the rural population have been infected by the Trypanosoma organisms. If this is so, 500,000 or more of the 3,500,000 inhabitants who have been in contact with triatomas have been infected with a Trypanosoma.

The Ministry of Public Health held a conference on trypanosomiasis in the last week of June. A special department of the Ministry of Health, under the direction of Dr. Cecilio Romaña, is in charge of prevention of this disease. The fight against the Triatoma insects is based on (1) making houses insect-proof and (2) use of insecticides, DDT, and fumigation with smoke containing DDT. Results of the preliminary trials of these methods have been very gratifying.

Mortality of Young Rats at Mountain Heights.—In the Institute of High Altitude Biology organized by the University of Tucumán in Mina Aguilar (province of Jujuy) at 3,990 m. (12,000 ft.), Dr. Hugo Chiodi (director of the Institute) observed interesting facts on the mortality of young rats in the first days of life. According to Monge (in Peru), in the first Spanish settlement in Potosí, men and animals living in the high mountain could not have descendants. Chiodi observed that only 7 young rats out of 46 newly born at mountain heights could survive more than 30 days and they died at 38, 42, 45, and 100 days of age.

The mortality of 436 newly born rats was 35% in the first three days. The causes of death were liver damage and fatty degeneration. The animals survived when they were maintained at the same altitude with the same food for 30 days and when the oxygen pressure was similar to that of sea level.

When the animals reached 30 to 40 days of age, they survived well under the same conditions. The danger was only for rats younger than one month. Older rats showed no hepatic lesions and survived without apparent disturbances.

Second Argentina Congress of Gastroenterology.—The Second Congress of Gastroenterology was held in Mar del Plata, April 14-18. Abnormalities of the stomach found at operation were the subject of the reports and discussions. The subject was considered from the standpoint of hematological variations, physiopathology, radiology, gastroscopy, gastric ulcers, gastrointestinal pathology, biliary pathology, endocrine effects, and dietetic treatment. The president of the congress was Dr. Marcelo Royer. Guests of honor were the German professor Dr. Henning and some Brazilian physicians. Representatives of the Argentine gastroenterological centers attended the meetings, which were very successful.

The items in these letters are contributed by regular correspondents in the various foreign countries.

AUSTRALIA

Typhoid Epidemic Traced to Unusual Cause.—In Victoria, New South Wales and Australian Capital Territory, an epidemic of typhoid developed last June, and the total number of cases to date is 56, of which 28 occurred in New South Wales and 24 in Victoria. An investigation of all the usual sources failed to elucidate the cause. The scattered incidence seemed contrary to usual experience. At Moorabbin, a suburb 11 miles (17.7 km.) from Melbourne, the senior health inspector, Mr. N. T. Davies, was persistent in questioning families infected. He was seeking a common food item that was eaten raw but that would store well and that could be distributed over a wide area.

The first clue came from two infected families who admitted a fondness for "Snowballs." These are confections made from artificial marshmallow (gelatin) and rolled in desiccated coconut. In a third family, Mr. Davies found some homemade cookies rolled in desiccated coconut. Packets of desiccated coconut were taken from each of the three homes, and each packet gave a positive culture. Samples of the same brand of desiccated coconut were collected from grocery stores and were found to be contaminated. Serologic and biochemical comparisons of these cultures with those isolated from the patients with typhoid corresponded. The brand of desiccated coconut involved is called "Tropic Snow" and is imported by Harrisons Ramsay Pty. Ltd. from Papua, New Guinea. Other brands from Ceylon and Papua have been found to be free from contamination.

Householders in Victoria have been advised by the State Health Minister to burn their supplies of desiccated coconut. The importing firm voluntarily recalled all unsold stocks in wholesale and retail trade channels. In other states, householders have been asked to treat all desiccated coconut as suspect and to boil it before use. All brands of dried coconut are being sampled throughout Australia. So far, no other brands have been found to be infected.

The health department in Papua has been asked to investigate the possible source of infection at the points of manufacture and transport of the desiccated coconut. Wholesale and retail suppliers of this product in Queensland have been ordered to sterilize their stocks of desiccated coconut. Retailers in Victoria have voluntarily destroyed their stocks of the "Tropic Snow" brand. A search of the literature on Typhoid has failed to reveal any evidence of previous epidemics due to desiccated coconut.

BRAZIL

Panamerican Congress of Surgery.—All surgeons of North and South America are being invited to attend the First Panamerican Congress of Surgery, which will be held in Curitiba, state of Parana, Brazil, on Oct. 5-9, 1953. This congress and the second congress of the Brazilian section of the International College of Surgeons will meet jointly under the sponsorship of the government of Parana, as a commemorative event of the first centennial of that state. The official themes are: "Death During Anesthesia," Prof. Max Thorek, Chicago; "Indications and Contraindications of Thoracotomies," Prof. Jorge Taiana, Buenos Aires; and "Surgery of the Biliary Ducts," Dr. Francisco Augusto Pinto, Rio de Janeiro. Other papers of general interest will be presented by speakers from North and South American countries.

Intestinal Obstruction.—In a paper read before the Medical Society of São Paulo, Dr. Luiz Oriente described his research on acute experimental intestinal obstruction and antibiotics, which he performed in the hospital "Julio Pignatari," department of experimental surgery. He employed 11 dogs, separating them in three groups. In the first group, he used

penicillin, in the second streptomycin, and in the third a combination of streptomycin plus 30% sodium sulfacetimide. The operations, as well as the reoperations, were performed under aseptic conditions, with intravenous anesthesia. Dr. Oriente compared survival after obstruction had taken place with the results obtained after reoperation, accomplished some hours (10 and 24) after the establishment of occlusion with strangulation. Antibiotics were used only after the operation and were given only by a parenteral route. His conclusions are as follows. The combination of streptomycin plus sodium sulfacetimide gave the best results concerning survival following obstruction and reoperation (resection and anastomosis). These results were confirmed by the clinical course and by examinations of anatomy and pathology. The medicaments greatly increased the safety in acute obstruction, delayed complications, and reduced the mortality rate. They represent potent auxiliary measures in the treatment of acute intestinal obstruction, especially when associated with surgical treatment, but they never should be used to replace or delay surgery.

NORWAY

Indications for Operative Treatment of Uncomplicated Peptic Ulcer.—At a meeting in Oslo last March of the Norwegian Surgical Society the opening address was given by Dr. Olaf Rømcke, who is in charge of the Drammen City Hospital. In collaboration with his colleagues he studied the records of 382 patients who had gastric or duodenal ulcers and who were given routine medical treatment in the Drammen Hospital from the beginning of 1935 to the end of 1937. Three years later 44% of the patients with gastric ulcers and 34% of those with duodenal ulcers were symptom free. After eight years the 44% was reduced to 22% and the 34% to 11%. Patients with a history of symptoms lasting more than five years had a much worse chance of ultimate recovery than patients with a shorter history. For this reason and various others, Rømcke advises operative treatment when symptoms have lasted for more than five years, when a relapse follows medical treatment in hospital, or when the patient cannot remain symptom free with slight dietetic restrictions.

One of the tables in the report showed the percentage of hospital patients selected for operative treatment year by year from 1935 to 1950. In the first year this percentage was only 19, whereas in the year 1949-1950 it was 35. This remarkable trend is largely a sequel to the fall in recent years of the operative mortality and the success with which postoperative hypochylia or achylia is achieved. Quoting the axiom "no acid, no ulcer" Dr. Rømcke would like to see the treatment of peptic ulcer by medical means put on a successful footing by the discovery of a remedy capable of inducing achylia without any troublesome or alarming side-affects.

TURKEY

Syphilis in Afghanistan.—In volume 11, number 2, of *Bursa Klinik*, Prof. Halil Gürün, who spent four years in the department of dermatology and venereal diseases at the medical school in Kabul, Afghanistan, reports on syphilis. In the course of time, foreign armies have traversed and occupied the country so the disease has been there a long time and has become endemic. The people have given the disease different names in different parts of the country. In the north, they call it "Gül-Efshan" probably because of the roseols in the second stage; in the central and southern regions it is named "Satan's disease" because of the terrible effects of the third stage; and in the east near Pakistan, the people say "Iblis," probably a corruption of the word syphilis used by the British physicians in India. In 1951, Professor Gürün made an investigation of the various public schools and found that of 1,713 students from 64 regions 115 (6.65%) had positive serologic reactions. The Kahn, Kolmar, Klein, and venereal disease routine laboratory tests were made at the United Nations International Children's Emergency Fund laboratory in Kabul. These students had all passed the physical examination on admission to the schools. Of 22,419 patients examined at the outpatient clinic in 1951, 2,041 (9.1%) had syphilis, and, of 13,509 patients examined during the first six months of 1952, 1,486 (11%) had syphilis. The World Health Organization team that investigated schools, poorhomes, and prisons arrived at the same percentages.

The majority of 378 patients admitted to Professor Gürün's clinic were in the first and second stages of the disease; 78 patients had primary syphilis; all had spirochete positive reactions; and 72 had positive serologic reactions. Forty-nine patients in the second stage had positive serologic reactions, and, of these, 17 had positive dark field reactions. Of 26 patients with congenital syphilis, 16 had positive serologic reactions. In other departments of the medical school hospital, syphilis is primarily responsible for parenchymatous keratitis, iritis, iridocyclitis, atrophy of the optic nerve, retrobulbar gumma, myelitis, meningitis, leptomeningitis, general paralysis, tabes, and neuritis. The medical department statistics indicate an abundance of visceral syphilis.

The statistics compiled by Dr. Münevver Özdolay, a Turkish physician with many years' experience in Afghanistan, indicate that 12% of the patients she examined had syphilis. The majority of patients in the department of dermatology and venereal diseases of the Mesturat Woman's Hospital show symptoms of syphilis innocentum. Outside of Kabul in the provinces, syphilis resembles an epidemic; patients with third stage lesions predominate. Of 281 patients admitted to the clinic in Aliabad, 127 (45%) had lesions involving destruction of the nose, esophagus, palate, or gums. Destruction of the digestive and respiratory systems often necessitated tracheotomy. In August, 1951, during an investigation of leprosy in Hezaracat, a mountainous, sparsely populated region with scarcely any outside contact, there appeared to be an even higher percentage of syphilitic persons than in Kabul. Investigation in the villages was not possible, but questioning revealed that the disease is widespread and no relief is available. Ignorance, poverty, and lack of medical care and personnel have made the scourge rampant. Outside assistance is urgently needed. There are few pharmacies, and quacks do good business selling pills that contain large amounts of arsenic and mercury and that result in toxemia. Home remedies are also widely used. There is very little foreign currency for the import of foreign pharmaceutical products. Their import is only permitted two agencies, the Ministry of Health and the medical school. The products are stored at the health department, and their release requires many formalities and the signature of the Minister of Health. Some of the products find their way into the black market with the result that lack of a quantity sufficient for effective treatment leads to premature termination of therapy.

Professor Gürün concludes that, if, as he recommended in a letter of Sept. 21, 1951, to Mr. T. Guthe of the World Health Organization, mobile teams with one venereal disease specialist, one serologist, one technician, and equipment were established in Kandihar, Herat, Meymene, Mezarisherif, and Djelalabadand and if the team currently stationed in Kabul were expanded so that native personnel could be trained and health department and health propaganda instituted, it would greatly benefit the Afghan people. There is only one medical school, with 30 students in the first year, that graduates 15 to 20 students each year. Among the faculty are professors from Turkey, Germany, and France. There is one physician to every 40,000 inhabitants. Even if the medical school expands, many years will elapse before public health can come into its own. Currently the allocation for the health department is 3.5% of the general budget; this amount is even inadequate to contend with tuberculosis, malaria, leprosy, parasitic diseases, seasonal epidemics, and salaries for personnel in a country with 12 million inhabitants. The intelligent and industrious Afghan people have preserved their independence in the face of much outside pressure and deserve assistance.

CORRESPONDENCE

CHEST PAIN FROM EXPOSURE TO SOIL DUST

To the Editor:—So-called "dust pneumonia" is a common entity in many areas of the United States where farmers are required to work in air heavily laden with dust particles It consists of a primary bronchitis and pneumonitis following exposure to dust. In the past, the disease was frequently fatal. It is definitely infectious in character, although mechanical irritation plays a part in the etiology. Chest pain can be caused by exposure to dust. I have seen several patients who have been thoroughly studied for possible accessory factors, and none have been found. The patients were all farmers from the dust bowl area in southeastern Colorado, and each of them had recently begun farming operations that required long and intensive exposure to soil dust. During the period in which these patients were examined, soil dust was not excessive and exposure to dust probably was not any more intense than in any average area in the western states.

An example is a 24-year-old farmer who suffered a gunshot wound of the right apex in 1946; the bullet entered the erector spinae muscles on the right side at the level of the second thoracic vertebra and emerged at the anterior border of the axilla immediately inferior to the lower border of the pectoralis major muscle. This man first noticed vague chest pains several years later. He recalled then that he had been working with very dusty broom corn immediately preceding the onset of these pains. In his own words: "When we worked with the broom corn, the dust fogged up like a storm." He consulted his family physician who told him that he had normal temperature, pulse, respirations, and blood pressure and that there were no signs of disease in the chest. He was given 250 mg. of oxytetracycline (Terramycin) every 6 hours for 12 doses and told to remain indoors. He stated that the pain stopped within 48 hours and that he felt much better. There were no further symptoms until a month later when, once again, he was exposed to dust in the field. He experienced, at that time, moderately severe chest pain indefinitely localized through the right middle lung field. There were occasional severe and lancinating pains. He was again taken to his family physician and was told that the physical examination showed nothing abnormal. On the same day, he was admitted to the regional veterans' hospital where a thorough study was made that included careful neurological and general examination, with emphasis on determination of the possible effect of his old bullet wound on present symptoms. At the conclusion of these studies, the man was told that no cause for his pain had been found. During the next three months, he had repeated episodes of the pain, which became gradually severer. It was still localized, though indefinitely, in the right middle lung field, but it had begun to occur in the left hilar region as well as the right. The pain occasionally seemed to radiate to the right upper arm. Pain was described as dull, with occasional sharp, shooting pains in the same area; it was invariably relieved by staying indoors for a day or two. Physical and roentgenologic examination showed a normal chest. Routine blood and urine studies were normal. Our first thought was that this was a psychoneurotic episode, but careful questioning revealed nothing. We were puzzled by the fact that the pain disappeared during the 48 hours that the patient was in our clinic. The patient himself suggested that the cause might be the dust, and on careful questioning he could recall exposure before each episode of pain and relief within 48 hours of termination of exposure. He purchased a filter type dust mask and has had no further episodes while wearing it. At our request, he worked one day without the mask, and typical pain recurred. He was again examined carefully with the thought of a possible allergy in mind. No signs could be found. He has continued to wear the mask and has had no further symptoms.

Two other cases examined equally thoroughly resulted in similar conclusions and results. In this small series, it would seem that the only possibility is that the inhalation of soil dust produces pain. We believe that an infectious process has been ruled out in all of these cases and that the lesion is unquestionably a mechanical irritation of the larger bronchi. It is possible that anatomic factors causing a more rapid change in direction of the stream of air and dust may be responsible for the consistent appearance of pain on the right. Increasing mechanization in farming probably makes the machine operator subject to inhalation of large amounts of dust. We would recommend a simple filter mask for those so exposed.

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BUREAU OF LEGAL MEDICINE AND LEGISLATION

MEDICOLEGAL ABSTRACTS

Medical Practice Acts: Naturopath's Violation of Medical Practice Act By Use of Title "Dr."—The defendant was tried in the municipal court on the charge that he unlawfully advertised and announced himself to be a practitioner of medicine and surgery before he had obtained a certificate from the state medical board as required by law. From a verdict of guilty, he appealed to the court of appeals of Ohio, Franklin County.

The record reveals that the defendant had an office located at 889 East Broad Street, Columbus, Ohio, that hanging over the entrance to the building was a neon sign that read "Dr. Farrand's Naturopathic Clinic." The sign was written in three lines with the word "naturopathic" in the middle and in letters much smaller than the others. Three witnesses testified on behalf of the state concerning treatments received from the defendant on or about the time specified.

It was urged by the defendant that the judgment is contrary to law and he alleged that the record does not reveal that (he) the defendant advertised himself as a practitioner of medicine or any of its branches. The question presented is, therefore, whether the word "naturopathic" as used in the sign prevented any statutory violation that might otherwise have existed. The practice of medicine, said the court, is defined by the General Code, which provides:

"A person shall be regarded as practicing medicine, surgery or midwifery, within the meaning of this chapter who uses the words or letters, 'Dr.' . . . which in any way represents him as engaged in the practice of medicine, surgery or midwifery, in any of its branches. . . .

"The use of any such words, letters or titles in such connection or under such circumstances as to induce the belief that the person who uses them is engaged in the practice of medicine, surgery or midwifery, shall be prima facie evidence of the intent of such person to represent himself as engaged in the practice of medicine, surgery or midwifery."

In connection with the foregoing statute, said the court, the record reveals that the defendant advertised himself as "Dr." The record also reveals that the giving of the massages and treatments for the cure or relief of bodily infirmities or diseases constituted such surrounding circumstances as to induce the belief that he was engaged in the practice of medicine. For these reasons all of the statutory requirements were met in order to sustain a conviction. The use of the word "naturopathic" in the sign does not prevent the act from being a violation. This was clearly pointed out in a prior Ohio case in which the court said:

"The appellant contends that he was practicing naturopathy which is not medicine or any of its branches within the purview of G. C. § 12694. We are not interested in what name or title the appellant gives to his profession, but we are only interested in whether or not what he did constituted the practicing of medicine as defined by G. C. § 1186."

The judgment is, therefore, not contrary to law, said the court of appeals, and the evidence was clearly sufficient to sustain the charge since a prima facie case was established that was never overcome as the defendant offered no evidence in his behalf. Accordingly the judgment of conviction was affirmed. *State v. Farrand, 105 N. E. (2d) 656 (Ohio, 1951).*

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Esophageal Curette. E. B. Emerson Jr.—p. 522.
Plastic Surgery During Year 1951: Summaries of Bibliographic Material Available in Field of Otolaryngology. L. A. Peer and J. C. Walker Jr. —p. 525.

Perceptive Deafness Associated with Tetanus Antitoxin.—More than 50% of the neurological complications associated with serum injection have followed the prophylactic administration of tetanus antitoxin; when untreated or alum-precipitated tetanus toxoid is used, reactions of all kinds are markedly reduced. The neuropathological changes following injection of serum are not clearly understood, but they are apparently similar to allergic changes produced elsewhere in the body. Their occurrence cannot be foreseen. Auditory nerve involvement, now reported for the fifth time (twice after therapeutic doses), followed a prophylactic injection of 3,000 units of tetanus antitoxin given to a 23-year-old woman who suffered a laceration of the knee when thrown from a horse. There was no head injury, concussion, or unconsciousness. Generalized giant urticaria, necessitating the use of subcutaneously administered epinephrine for relief, appeared one week after the injection, and on the following day sudden deafness and persistent tinnitus developed. Vertigo was not present at any time. Examination three months later showed that the ear, nose, and throat structures were basically normal; hearing loss amounted to 69% in the right ear and 62% in the left ear, and was complete in both ears at 2,000 cps and above. The diagnosis was bilateral deafness, perceptive type with normal labyrinth, caused by serum reaction following a prophylactic dose of tetanus antitoxin. No improvement was found at follow-up. Attempts at therapy have generally proved ineffectual, but patients with serum sickness showing a tendency toward tinnitus, vertigo, or impairment of hearing should be given immediate treatment to counteract the impending nerve damage. Suggested remedies include epinephrine, the antihistamines, cortisone, and possibly histamine intravenously, but they must be used promptly before the pathological changes are established.

Corticotropin (ACTH) in Lethal Granuloma of Nose and Face.—Lethal granuloma of the nose and face is apparently an allergic lesion closely related to rheumatic fever and certain vascular lesions such as periarteritis nodosa and lupus erythematosus disseminatus. Efforts at treatment were formerly unsuccessful and death from exhaustion or hemorrhage was inevitable, but encouraging results have lately been obtained with cortisone. Seven months' follow-up of a 60-year-old man treated by the authors with corticotropin shows sustained healing of a lethal granuloma involving the nose and face. Complete surgical removal had previously been found impractical and ulceration had followed the breaking down of the operative incision. Penicillin and streptomycin were given intramuscularly in an attempt to control secondary infection and bacitracin and tyrothrycin ointments were applied locally without effect. The patient was then given 25 mg. of corticotropin intramuscularly four times a day and was placed on a low salt diet. Intake-output, weight, and blood pressure records were kept, but no complications of any kind were noted as a result of the treatment. The dosage schedule was changed, after five days, to 25 mg. three times a day for 12 days, and then to 17 mg. three times a day for 8 days. Definite improvement in the lesion was apparent at the end of about two weeks and continued steadily thereafter. Administration of corticotropin was stopped after 25 days, and no further treatment has been needed.

Alabama State Medical Assn. Journal, Montgomery

22:279-326 (May) 1953

Metabolic Aspects of Convalescence: 1953 Jerome Cochran Lecture. C. Lyons.—p. 279.
Ineffectiveness of ACTH and Riboflavin in Chronic Porphyria. J. M. McMahon.—p. 284.
Use of Polyethylene Tubing for Abdominal Drainage in Cirrhosis of Liver. W. Reynolds Jr.—p. 289.

22:327-378 (June) 1953

Management of Hand Injuries. F. A. Marzoni and S. E. Upchurch. —p. 327.
Management of Fertility Problems. H. H. Thomas.—p. 334.
Blood Groups in Retrolental Fibroplasia: Review of Literature. T. O. Paul.—p. 337.

American J. Digestive Diseases, Fort Wayne, Ind.

20:117-148 (May) 1953

Nutrition and Blood Pressure. C. M. Wilhelmj, J. McDonough and H. H. McCarthy.—p. 117.
Incidence of Asymptomatic Hiatus Hernia. W. F. Cernock.—p. 123
Significant Facts Concerning Papilla of Vater. J. A. Sterling.—p. 124.
Preliminary Evaluation of New Drug, Antrenyl: Effect on Gastric Secretion, Motility and Results in Symptomatic Care of Peptic Ulcer. P. E. Mattman and L. Strutner.—p. 126.
Calcified Cyst of Pancreas. J. T. Paul.—p. 136.
Spontaneous Hypoglycemia in Acute Gastro-Enteritis. W. Saphir.—p. 138.

Periodicals on file in the Library of the American Medical Association may be borrowed by members of the Association or its student organization and by individual subscribers, provided they reside in continental United States or Canada. Requests for periodicals should be addressed "Library, American Medical Association." Periodical files cover only the last 11 years, and no photoduplication services are available. No charge is made to members, but the fee for other borrowers is 15 cents in stamps for each item. Only three periodicals may be borrowed at one time, and they must not be kept longer than five days. Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted.

American Journal of Human Genetics, Baltimore

5:1-106 (March) 1953. **Partial Index**

Dynamics of Racial Intermixture—Analysis Based on the American Negro. B. Glass and C. C. Li.—p. 1.
Seasonal Variation in American Live Birth Sex Ratio. H. M. Slatis. —p. 21.
Qualitative and Quantitative Control of Adult Hemoglobin Synthesis—Multiple Allele Hypothesis. H. A. Itano.—p. 34.
*Heberden's Nodes: Family History and Radiographic Appearance of Large Family. R. M. Stecher, A. H. Hersh and H. Hauser.—p. 46.
Possible Genetic Factors in Etiology of Rheumatic Fever. I. A. Uchida. —p. 61.
Pedigree of Syndactylism of Middle and Ring Fingers. M. F. A. Montagu. —p. 70.
Calculation of Reproductive Fitness and Mutation Rate of Gene for Chondrodystrophy. R. E. Popham.—p. 73.

Hereditary Aspects of Heberden's Nodes.—After defining Heberden's nodes, Stecher and associates state that previous studies on the nature of these nodes indicated that the idiopathic form of osteoarthritis of the finger joints is independent of other forms of osteoarthritis, of obesity, or of hypertension; it is related to the menopause, develops only in the presence of normal nerve supply to the hand and fingers, and is inherited as an autosomal sex-influenced trait, being dominant in women and recessive in men. They tested this theory of inheritance on a large family with nine affected persons out of 30 in three generations. Clinical and roentgenological data allow a distinction between idiopathic and traumatic Heberden's nodes. In idiopathic nodes the joint space is narrowed and irregular, and spurs arise from the bones about the terminal joint. In traumatic nodes the joint space is usually normal, the joint surfaces are smooth, and a heavy bony buttress extends dorsally from the proximal end of the distal phalanx. Early cases of idiopathic Heberden's nodes can be recognized radiographically when they are not noted clinically by small islands of bone in the extensor tendons near the distal phalanx. This also occurs as a result of poor expressivity, which explains certain heretofore apparent inconsistencies in the data and makes them thoroughly compatible with the proposed theory of inheritance.

American Journal of Surgery, New York

85:711-820 (June) 1953

Use of Dextran (Macrodex) in Burns: I. Review of Physiology of Dextran. E. V. Johnston and J. S. Lundy.—p. 713.
*Id.: II. Clinical Evaluation in Eight Cases. E. V. Johnston, J. S. Lundy, W. A. Bennett and J. M. Janes.—p. 720.
Medicolegal Implications of Paralysis of Recurrent Laryngeal Nerve. D. E. Ross.—p. 729.
Management of Thoracoabdominal Injuries at Mobile Army Surgical Hospital Level in Korea. E. E. Rockey.—p. 738.
Penetrating Wounds of Chest: Review of 251 Cases. J. L. Farringer Jr. and D. Carr.—p. 747.
Bile and Contrast Medium Reflux into Pancreatic Ducts. F. K. Kämmerling.—p. 752.
Secondary Operations on Biliary Tract. C. P. Schlicke.—p. 754.
Operative Treatment for Recent and Complete Tears of Coracoclavicular Ligaments. C. F. Orofino and A. H. Stein Jr.—p. 760.
Protrusio Acetabuli. Z. B. Friedenberg.—p. 764.
Epidermoid Cyst of Terminal Phalanx of Finger: With Review of Literature. I. Zadek and H. G. Cohen.—p. 771.
Gastrocolic Fistula Complicating Carcinoma: Report of Case Due to Carcinoma of Colon, with Successful Resection. R. J. Schweitzer and M. P. Osborne.—p. 775.
Solitary Diverticulitis of Cecum. H. M. Unger.—p. 780.

Clinical Evaluation of Dextran in Burns.—A 6% solution of dextran in 0.9% isotonic sodium chloride solution (Macrodex) was given a therapeutic trial in eight patients with thermal burns at the Mayo Clinic. Dextran, as a colloidal agent for combating the potential shock in severe burns, was thought to be equal to human plasma in similar cases. The correction of the existing shock and depletion of blood volume were satisfactory in the authors' patients. No untoward reactions or complications attributable to dextran were observed in these patients. Hemodilution anemia was not a problem. The concentration of proteins decreased after infusion of dextran; this decrease was attributed not only to the effects of hemodilution but also to an active supplanting of the plasma proteins, particularly the albumin fraction. A modification of the Kingsley biuret method has been devised for the determination of proteins and was used satisfactorily in the presence of dextran. Five of the eight patients died of their severe burns, and necropsies were performed in four. They revealed a singular lack of significant pathological changes, with the exception of reversible renal changes in the proximal and distal convoluted tubules. Further investigation of the relationship, if any, between these changes in the convoluted tubules of the kidney and those associated with the syndrome of "lower nephron nephrosis" is desirable. The authors are in accord with Evans and co-workers and others who recommend use of dextran solutions as plasma volume expanders in the treatment of burns that are not extensive. The authors recommend dextran as a useful agent in the early stages of more extensive burns, with the reservation that evidence of renal failure or hemoglobinuric nephrosis should, at present, be considered an indication for use of pooled plasma in preference to dextran. Oral intake of protein supplements is a necessary adjunct of burn therapy and takes on even greater importance with the prolonged use of dextran. Dextran is recommended primarily for use in the early or shock phase of burns and in conjunction with administration of whole blood. The oral route should be utilized whenever possible for administration of protein supplements and as much of the required electrolyte and other noncolloidal solutions as practicable.

Angiology, Baltimore

4:183-282 (June) 1953

*Treatment of Hypertension with Hydergine: Review of 200 Cases. R. Wilbrandt.—p. 183.
Use of Oral Hexamethonium Chloride (Methium®) in Treatment of Hypertension. P. H. Kuhn.—p. 195.
Essential Hypertension: Birth of Its Concept 200 Years Ago. M. Backer. —p. 207.
Arteriolar Circulation as Factor in Results Obtained in Sympathectomy for Peripheral Arterial Occlusive Disease. R. J. Popkin.—p. 210.
Regional Treatment of Thrombophlebitis. L. Blum.—p. 214.
Postphlebitic Syndrome: Discussion of Surgical Treatment. L. A. Ensenat. —p. 217.
Experimental Creation of Atrial Septal Defects, with Some Notes on Production of Right to Left Atrial Shunt. T. C. Moore and H. B. Shumacker Jr.—p. 244.
Fluorescein after Exercise: Method of Investigation in Peripheral Arterial Diseases. B. Ejrup.—p. 253.
*Paravertebral Block with Aqueous Phenol in Treatment of Vascular Disease. H. A. Haxton.—p. 268.

Treatment of Hypertension with Hydergine.—Hydergine (containing equal parts of the hydrogenated ergot alkaloids dihydroergocristine, dihydroergocornine and dihydroergokryptine) was given to 200 ambulant patients with hypertension. Half of the patients had mild hypertension with stage 1 and 2 fundus changes and the other half had severe hypertension with stage 3 and 4 fundus changes. Initial treatment was started with from 10 to 20 injections of 1 cc. of Hydergine daily or every other day; then combined treatment with 10 to 30 drops of Hydergine solution or 1 to 2 sublingual tablets three times daily supplemented by biweekly injections was carried out. Of the 100 patients with mild hypertension, 59 responded with lowering of blood pressure and 80 with improvement of subjective symptoms. The corresponding figures in the patients with severe hypertension were 31% and 52% respectively. Of 80 patients with mild hypertension without renal damage, 54 (67.5%) reacted with lowering of blood pressure and 67 (84%) with improvement of subjective symptoms. Of 20 patients with mild hypertension and some renal damage, only 5 (25%) and 13 (65%), respectively, showed improvement. In 54 patients with severe hypertension without renal damage, Hydergine lowered the blood pressure in 27 (50%) and improved subjective symptoms in 39 (72%). Corresponding values for 46 patients with severe hypertension and with renal damage were 10% and 30%. These differences are statistically significant. Experiments with placebos showed that the effect of Hydergine on the blood pressure and subjective symptoms was in most patients not psychogenic. Hydergine was well tolerated. The advantage of ambulant treatment and the necessity of prolonged therapy (not less than three

months) is emphasized. Follow-up of patients was not long enough to permit the evaluation of the effect of Hydergine on survival rates.

Paravertebral Block with Aqueous Phenol.—Paravertebral infiltration of the sympathetic chain with 10% phenol in water, either by the lumbar or the thoracic route, was used in 400 patients with circulatory disorders and hyperhidrosis in the extremities. The method was found to be satisfactory for producing lasting sympathetic interruption in the extremities. The substance acts by destruction of the sympathetic ganglion cells. Striking relief of pain and accelerated healing of necrotic areas were obtained in a high proportion of cases of arteriosclerotic ischemia of the foot. About 50% of the patients with intermittent claudication obtained distinct benefit from paravertebral injection of the lumbar chain. Good improvement was obtained in erythrocyanosis and perniosis. If only temporary benefit in acute thrombophlebitis results from a single paravertebral block with procaine hydrochloride, it is better to inject aqueous phenol and secure a more lasting sympathetic interruption than to carry out repeated procaine injections. In some cases in which ulcers were present for several years after thrombophlebitis in the legs, injections of phenol were followed by healing within a few weeks. Several cases of mild hyperhidrosis of hands and feet have been successfully treated by paravertebral block with aqueous phenol, improvement having lasted over three years in some of the patients. Although the results of sympathectomy may be more reliable and more lasting, in the many cases that are unsuitable for sympathectomy injection of 10% phenol is an effective substitute. Hyperesthesia in the groin after the lumbar injection, caused by irritation of the genitofemoral nerve, developed in about 10% of the patients. It was seldom troublesome and subsided in about three weeks. The chances of complications are considerably greater with injection of the cervicothoracic portion of the sympathetic chain; intercostal neuritis lasting occasionally up to two months resulted in about 20% of the cases. Complications can be minimized with sound technique and accurate placement of the injection around the sympathetic chain where it is not near important and easily damaged structures.

Annals of Surgery, Philadelphia

137:577-780 (May) 1953

Thrombo-Embolic Phenomenon—Local Process with Regional Spread and Systemic Complications. M. Gage.—p. 577.
Hind Gut Duplication—Doubling of Colon and Genital Urinary Tracts. M. M. Ravitch.—p. 588.
*Selective Lobotomy in Treatment of Intractable Pain. E. G. Grantham and R. G. Spurling.—p. 602.
Herniation of Right Diaphragm Secondary to Trauma. E. C. Strode and C. A. Vance.—p. 609.
Bronchogenic Carcinoma Simulating Benign Pulmonary Disease. G. V. Brindley Jr.—p. 616.
*An Assessment of Therapy of Burns: Clinical Study. C. A. Moyer. —p. 628.
Treatment of Fibrosarcoma. E. S. Stafford and G. E. Ward.—p. 639.
Adrenal Tumor with Cushing's Syndrome. A. W. Hartman, L. B. Reppert and R. L. Smith.—p. 645.
Hemangiomas. J. B. Brown, M. P. Fryer and F. McDowell.—p. 652.
*Carcinoma of Cervix—An Experience with Surgical Treatment. J. V. Meigs.—p. 660.
Fallibility of Roentgenograms in Diagnosing Lesions of Colon. J. M. T. Finney Jr. and D. H. Stone.—p. 674.
Cancer as a Chronic Disease. J. J. Morton Jr. and J. H. Morton.—p. 683.
Hemipelvectomy and Hip Disarticulation for Malignant Tumors of Pelvis and Lower Extremity. C. M. Lee Jr. and L. P. Alt.—p. 704.
Use of ACTH and Cortisone in Surgery. W. H. Cole, W. J. Grove and M. M. Montgomery.—p. 718.
Some Common Denominators in 1200 Cases of Cardiac Arrest. H. E. Stephenson Jr., L. C. Reid and J. W. Hinton.—p. 731.
Aortic Stenosis: Surgical Problem. R. A. Daniel Jr. and H. W. Scott Jr. —p. 745.
Progressive Constrictive Occlusion of Aorta with Wiring and Electrothermic Coagulation for Treatment of Arteriosclerotic Aneurysms of Abdominal Aorta. A. H. Blakemore.—p. 760.
Some Technical Considerations in Operative Treatment of Varicose Veins. A. Webb Jr.—p. 778.

Selective Lobotomy for Intractable Pain.—Discussing the use of lobotomy in the treatment of intractable pain, Grantham and Spurling say that in 1949 Grantham devised a technique for the selective destruction of certain portions of the prefrontal lobe to avoid resultant intellectual deficits and convulsive seizures. Results similar to those of a complete frontal lobotomy could be achieved by the division of the fibers of the two medial quadrants of the prefrontal lobe. Electrocoagulation with a high frequency current is applied by a special needle electrode through bilateral burr holes placed within the hair line 6 or 7 cm. above the glabella and 2½ cm. from the midline. The division was limited to the medial ventral quadrant, and if this was not sufficient, a similar lesion was made in the dorsal ventral quadrant later, thus destroying the association pathways from the medial and orbital surfaces of the prefrontal lobe. At first, only patients in the terminal stages of malignant disease were selected for the operation. These patients were addicted to morphine and no other operative procedure offered any prospect of relief. Later the operation was offered to other patients. To date there have been 71 operations on 51 patients, 18 having a second stage procedure, and two a third stage procedure. Malignant disease was present in 35 and atypical facial neuralgia in 3; the others had causalgia, thalamic syndrome, amebic liver abscess, scleroderma, ununited fracture of the femur, arthritis, complicated lumbar disk disease, and tabes dorsalis. Twenty-four patients lived less than three months after the operation, and in 15 of these pain became tolerable and narcotics were no longer required. Of the 26 patients who survived the operation for up to 43 months (average 15 months), 19 obtained very satisfactory results. Six of the 13 of this group, who are still alive, are carrying on their household duties, 3 men are gainfully employed, and 4 men are semi-invalids because of the primary disease. No patient upon whom this operation was performed for either intractable pain or psychosis (132 patients) developed convulsive phenomena. None of the patients on whom the operation was performed for intractable pain had detectable change in personality. There was one operative death. The authors feel that the operation should be reserved for those patients with or without drug addiction in whom extreme tension and anxiety are prominent.

Assessment of Therapy of Burns.—This statistical evaluation compares the relative efficacy of the two methods of treating burns and scalds in four institutions in the United States between the years 1944 and 1951. The two methods differed significantly in only two respects: in one whole blood and a buffered saline solution were used to treat peripheral circulatory failure and in the other plasma was employed. In the method in which blood and buffered saline were used to treat the shock, sodium chloride solution was given by mouth for 24 to 60 hours to prevent osmolar dilution (water intoxication) and in the other there was no restriction on water intake. Occlusive dressings were used in all cases. Sulfonamides were given parenterally to a few persons, and penicillin was routinely administered to all patients after 1945. Grafting was performed in all of the four institutions as soon as possible. The mortality from thermal injury was the same regardless of the type of therapy employed for injuries covering 15 to 35% and 70 to 100% of the body's surface. The mortality associated with thermal injuries covering 35 to 70% of the body was significantly less in Dallas between 1947 and 1952 and in Kankakee, Ill., than it was in Dallas in 1944 to 1947, and in two hospitals in St. Louis between 1946 and 1951. The reasons for the difference are not apparent. A simple method is presented for the comparative evaluation of burn and scald death rates based on American experience but patterned after the method of Bull and Squire of Glasgow, Scotland. The death rate from thermal injuries covering more than 55% of body surface is still 83%, in spite of the capacity to keep half of those who die alive for five or more days. The death rate among 315 patients who suffered second and third degree burns or scalds covering more than 15% of body surface was 23.8%. The death rate from burns and scalds in four American institutions was practically identical with that observed in Glasgow, Scotland, and Birmingham, England. The treatment of shock is no longer the major problem in burned patients.

Surgical Treatment of Carcinoma of Cervix.—Meigs analyzed the results he obtained with surgical treatment of carcinoma of the cervix in 100 women. The first patient was operated on in 1939 and the last in 1948. The patients all had stage 1 or 2 carcinoma. The series was slow to accumulate, because the author tried to operate on good risk, fairly young, and not too fat patients. The 100 patients were operated on without a death, owing to the use of blood transfusions, antibiotics, sulfonamides, and, above all, the surgeon's judgment as to whether or not he could safely do a radical operation. With increasing experience, nearly all patients with cervical cancer are now considered operable, but surgical treatment of the advanced cases is experimental. Meigs considers here only those who can be operated upon without the removal of bladder or rectum. He feels that roentgen ray and radium irradiation is still the proper treatment for carcinoma of the cervix. A solution of the ureteral, bladder, and rectal problems must be found before surgery can be advocated as a definitive treatment. Of the 100 patients, 75 were living and well five years postoperatively; in fact, many patients lived well beyond five years. Evaluation of the results with regard to the different grades of malignancy revealed that in grade 1 results are very satisfactory, but strangely enough results were better in grade 4 than in grade 3 and in grade 3 better than in grade 2. Of the 25 patients who died, 5 did so because of intercurrent disease and there was no record of recurrence in these 5. In 17 of the fatalities the lymph nodes were involved. Some of the patients had radiation treatment before the operation. A few with fungating growths were deliberately given one-half the usual roentgen ray and radium treatment. More patients who were not treated with radiation are living; more patients who were treated with radiation had lymph node involvement, and there were more fistulas in patients not treated with radiation than in those who were. No cancer was found in the cervix in 21 of the 46 irradiated patients, and only 6 of the 18 still living at the time of writing had received adequate irradiation. Heavy doses of radiation are not necessary to cure localized carcinoma and lymph node lesions will not be destroyed by irradiation. The results of surgical treatment of cancer of the cervix are very satisfactory. The importance of a check of "cured" cases by the pathologist is important, because the cure rate of cancer in situ is nearly 100%, and such cases should not figure in an evaluation of a therapeutic method.

Cincinnati Journal of Medicine

34:197-238 (June) 1953

*Surgical Treatment of Bleeding Esophageal Varices Secondary to Cirrhosis of Liver and Banti's Syndrome. R. R. Linton.—p. 97.

Surgical Treatment of Bleeding Esophageal Varices.—Linton comments on the selection of patients for portacaval shunts and the types of shunts. He reviews results in 83 shunt operations in 79 patients with bleeding esophageal varices. He considers the best method of treatment to be the by-passing of the portal venous blood in patients with bleeding esophageal varices secondary to portal hypertension by the construction of a splenorenal or a direct portacaval shunt. It is important to evaluate the function of the liver in all patients subjected to this type of surgery. In the majority of patients, a splenectomy with an end-to-side splenorenal anastomosis is the preferable procedure, since it carries less risk than a direct portacaval shunt, especially in patients with severely diseased livers. It also carries less risk in patients with the so-called Banti's syndrome (congestive splenomegaly), since in them the exposure of the portal vein is frequently impossible due to the cavernomatous change in the gastrohepatic ligament. Portacaval shunts should be reserved for the treatment of bleeding esophageal varices; they are not to be recommended for the treatment of ascites alone. A surgeon should not do a splenectomy alone unless he is prepared to do a splenorenal anastomosis at the same operation, since this may be the only opportunity to construct a satisfactory shunt.

Circulation, New York

7:801-960 (June) 1953

Degree of Coronary Atherosclerosis in Bilaterally Oophorectomized Women. J. H. Wuest Jr., T. J. Dry and J. E. Edwards.—p. 801.
Studies in Peripheral Arterial Occlusive Disease: II. Clinical Findings in Patients with Advanced Arterial Obstruction and Gangrene. S. Wessler and N. R. Silberg.—p. 810.
Atrial Septal Defects in Children: An Angiocardiographic Study. J. Lind and C. Wegelius.—p. 819.
Transposition of Great Vessels. J. D. Keith, C. A. Neill, P. Vlad and others.—p. 830.
Significance of Changes in Amplitude of First Heart Sound in Children with A-V Block. M. A. Shearn, E. Tarr and D. A. Rytand.—p. 839.
*Studies of Vasospasm: I. Use of Glyceryl Trinitrate as Diagnostic Test of Peripheral Pulses. W. T. Foley, E. McDevitt, J. A. Tulloch and others.—p. 847.
*Mortality and Other Studies Questioning Evidence for and Value of Routine Anticoagulant Therapy in Acute Myocardial Infarction. S. Schnur.—p. 855.
Study of Reflex Venomotor Reactions in Man. J. J. Duggan, V. L. Love and R. H. Lyons.—p. 869.
Response to Psychologic Stress in Persons Who are Potentially Hypertensive. R. E. Harris, M. Sokolow, L. G. Carpenter Jr. and others.—p. 874.
*Effect of Valsalva Maneuver on Circulation: III. Influence of Heart Disease on Expected Poststraining Overshoot. E. Elisberg, E. Singian, G. Miller and L. N. Katz.—p. 880.
Relationship Between Anatomic Position of Heart and Electrocardiogram: Criticism of "Unipolar" Electrocardiography. R. P. Grant.—p. 890.
Electrocardiographic Effects of Intravenous Veratrum Viride. S. R. Elek, J. D. McNair and G. C. Griffith.—p. 903.
Studies Utilizing Portable Electromagnetic Ballistocardiograph: IV. Clinical Significance of Serial Ballistocardiograms Following Acute Myocardial Infarction. H. Mandelbaum and R. A. Mandelbaum.—p. 910.
Right Auricular Electrokymogram of Normal Subjects. E. Booth, K. Willis, T. J. Reeves and T. R. Harrison.—p. 916.
An Analysis of Oscillometric Pulsations. S. Rodbard and F. Jannotta.—p. 922.
Proposed Nomenclature and Convention for Recording Ballistocardiogram. J. R. Braunstein.—p. 927.
First Report of Committee on Ballistocardiographic Terminology. I. Starr, J. R. Braunstein, W. Dock and others.—p. 929.
Treatment of Chronic Cor Pulmonale. R. M. Harvey, M. I. Ferrer and A. Cournand.—p. 932.

Studies of Vasospasm.—Use of glyceryl trinitrate in a test for vasospasm was studied in 96 persons. Nineteen had normal vasomotor tone, 29 had increased vasomotor tone as a result of Raynaud's disease and other syndromes with vasospasm as a prominent feature, and 48 had occlusive arterial disease. Observations were made before and after sublingual administration of 0.4 mg. of the drug on the character of the peripheral pulses, pulse rate, blood pressure, oscillometric readings in the feet and legs (and, when appropriate, at the wrist), and the color, temperature, and moisture of the hands and feet. Thirteen of the group were also tested in a constant temperature room where skin temperature studies and arterial pulse tracings were made. The results observed permit the following conclusions: Sublingual administration of glyceryl trinitrate aids greatly in the interpretation of the weak or peripheral pulse. It releases vasomotor tone of peripheral arteries, and the pulse that is weak or absent as a result of vascular spasm becomes bounding in character. Vessels totally occluded by organic disease remain impalpable. Vessels organically diseased and partially occluded increase their pulsation only to the degree of tone permitted by the pathological changes. Oscillometric readings are increased in proportion to the release of vasomotor tone. In most of the patients responding with an increase in pulsation, no increase in skin temperature or change in color or moisture of the skin occurred. Occasionally such changes were observed in digits in which the vessels had been in very severe spasm as in an acute Raynaud's syndrome. In no patient was there any serious discomfort. The glyceryl trinitrate test is simple to carry out and has practical clinical importance as a diagnostic procedure. It should not be used on patients in whom the maintenance of vasomotor tone is important, as in shock, febrile conditions, and debilitation. Recent myocardial infarction, anemia, and increased intraocular and intracranial pressure are additional contraindications to this test.

Anticoagulants in Myocardial Infarction.—The clinical records of 1,350 patients with coronary thrombosis and myocardial infarction who were hospitalized in several hospitals from 1941 to 1950 were studied with respect to (1) correlation of

the patient's condition on admission with the mortality rate, utilizing a quantitative method for determining degrees of illness; (2) the relationship of age to mortality rate; (3) comparison of certain items in this group with similar items in the study of the committee for the evaluation of anticoagulants in the treatment of myocardial infarction of the American Heart Association; (4) the effect of anticoagulant therapy on the mortality rate in several hospitals during one year as compared with mortality rates before anticoagulants were used. The published reports of reduced incidence of thromboembolism in treated groups as compared with control groups have not conclusively demonstrated that the decrease is wholly attributable to anticoagulant therapy rather than to such other factors as erroneous diagnosis, unconscious bias of the medical examiner, and deviations from the stringent requirements of truly controlled studies. Unless additional evidence to the contrary is presented, there would appear to be little reason to prescribe anticoagulants routinely in persons who are not severely ill because of the expense, inconvenience, dangers, and difficulty of maintaining constantly "effective" prothrombin blood levels. In more seriously ill patients, the theoretical advantages of anticoagulant therapy justify this treatment even though there may be some question as to whether its value has been demonstrated.

Effect of Valsalva Maneuver on the Circulation.—A study was made of the circulatory responses to the Valsalva maneuver by 10 normal persons and 51 patients. Of the patients, 22 had mitral stenosis, 3 pericarditis, 3 pulmonary vascular disease, 5 kyphoscoliosis, 3 organic heart disease without congestive failure, 6 organic heart disease with a history of congestive failure, and 9 congenital heart disease. The normal response following sustained straining, as in the Valsalva maneuver, is a rise in systemic arterial pressure and a reflex slowing of the heart rate. Normally there is a small overshoot in pulmonary artery pressure. This normal response was abolished in all three patients with pericarditis, in several patients with organic heart disease in whom congestive heart failure had been conspicuous in the past or was present at the time of testing, in some of the patients with pulmonary vascular disease (including kyphoscoliosis), and in some types of congenital heart disease. Pulmonary artery pressure did not rise after straining when there had been failure of the right ventricle. By observing the development of bradycardia electrocardiographically following straining, the clinician has a simple and useful tool for appraising the integrity of the cardiovascular system, since the presence of bradycardia suggests that overshoot in the systemic arterial pressure occurs. The absence of bradycardia when the autonomous system is intact suggests that an overshoot of systemic arterial pressure does not occur. The Valsalva maneuver, when performed under electrocardiographic control, is a simple, dynamic stress test of the circulation.

Gastroenterology, Baltimore

24:1-154 (May) 1953

Emergency and Definitive Treatment of Bleeding Esophageal Varices. R. R. Linton.—p. 1.
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Treatment of Tuberculosis Meningitis. R. F. Payne.—p. 234.
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*Occupational Potentialities of the Older Cardiac Patient. L. H. Bronstein, L. J. Goldwater and B. Kresky.—p. 252.
Electroshock Therapy in Functional Psychoses of Old Age. G. W. Robinson Jr. and J. D. DeMott.—p. 259.
Renal Function in the Aged. A. D. Mitchell and W. L. Valk.—p. 263.
Morbid Anatomy of Old Age: IV. Causes of Death. T. H. Howell and A. P. Piggot.—p. 267.

Occupational Potentialities of the Older Cardiac Patient.—The report concerns persons who are 55 years of age or over at the time heart disease develops. Records of 580 patients revealed that many patients with cardiac defects in the sixth and seventh decades of life can and do work successfully. Although continued employment does not have any adverse effect on the course of heart disease, the employment of the cardiac patient over 55 is less successful than that of the younger person with heart disease. The cardiac capacity of patients whose heart disease develops after 55 years of age is usually initially diminished to a greater extent than that of younger cardiac patients. Selective job placement presents greater problems in elderly persons. A study of the employment needs of 33 patients over 55 years of age with degenerative heart disease showed that 20 were working and 6 more were considered employable; only 7 were unable to work because of cardiac disability. This study and statistical analyses indicate that counseling and placement agencies should interview all cardiac patients whom the physician considers employable. Physicians should supplement the functional and therapeutic classifications with specific recommendations concerning hours per day or per week, and amounts of carrying, lifting, walking, and traveling a patient can do. Through selective placement, and with a reasonable amount of medical supervision, a considerable proportion of cardiac patients in the sixth and seventh decades can remain in useful employment.

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Studies on Host-Virus Interactions in Chick Embryo-Influenza Virus System: VII. Data Concerning Significance of Infectivity Titration End-Points and Separation of Clones at Limiting Dilutions. O. C. Liu and W. Henle.—p. 889.
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Journal of Gerontology, St. Louis

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Cerebral Hemodynamics in Cerebral Arteriosclerosis. J. F. Fazekas, A. N. Bessman, N. J. Cotsonas Jr. and R. W. Alman.—p. 137.
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Presence of Carbonic Anhydrase in Media of Human Aorta. J. E. Kirk and P. F. Hansen.—p. 150.
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Differential Mental Deterioration of Factorially "Pure" Functions in Later Maturity. K. W. Schaie, F. Rosenthal and R. M. Perlman. —p. 191.
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Journal of International College of Surgeons, Chicago

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*Peritoneal Dialysis as Means of Detoxication in Uremia and Other Toxic Conditions. H. Henninger.—p. 533.
*Treatment of Erb-Goldflam Myasthenia by Denervation of the Carotid Sinus. A. Thevenard, L. Leger and J. M. Marques.—p. 548.
Bilateral Protrusio Acetabuli: Progressive Deformity from Infancy. J. F. Brailsford.—p. 555.
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Phlebographic Study of Pelvic Venous System by Injection of Deep Dorsal Vein of Penis in Living Patient. B. S. Abeshouse and M. E. Rubin.—p. 576.
Incidence of Tail Gangrene in Thyroxin-Treated Rats Following Administration of Natural and Hydrogenated Alkaloids of Ergot. L. C. Massopust Jr., A. F. Sommers, J. T. Willson and A. R. Buchanan. —p. 592.
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Suprapubic One-Stage Prostatectomy with Primary Closure of Bladder. G. H. Ewell and J. J. Mueller.—p. 623.
Management of Chronically Diseased Cervix. T. L. Montgomery and P. A. Bowers.—p. 629.
One-Stage Operation for Gastrojejunocolic Fistula. H. Berman and F. S. Mainella.—p. 637.

Peritoneal Dialysis in Toxic Conditions.—Peritoneal dialysis is an effective method of rinsing out toxins and removing nonprotein nitrogen from the body. It can be used as a substitute for kidney function for 20 days or more. It is contraindicated when inflammatory processes are present in the vicinity of the peritoneum and when the patient's general condition is poor and the efficiency of the heart and vessels is reduced to the minimum. It was used successfully in 5 of 17 "hopeless" cases of renal injury; death in the other 12 cases resulted from irreversible lesions in the kidney or uncontrollable complications. Indications for peritoneal dialysis in the presence of anuria are the sudden appearance of uremia, either as a symptom of intoxication or as a complication of incompatible blood transfusion or various lesions (lower nephron nephrosis). Dialysis is also valuable in uremia with extreme oliguria caused by a reversible renal lesion, and in cases of soporific intoxication it may prove lifesaving. Stoppage of the outflow can be avoided or remedied by the use of two outflow catheters. Edema, which occurs on about the fifth day of dialysis, requires the intravenous administration of concentrated dextrose solution; pulmonary edema, encountered in three cases, occurred only in patients with inadequate circulation. An excessive reduction of albumin in the blood, which sometimes appears on the sixth or seventh day, can be corrected with blood transfusions.

Treatment of Myasthenia by Carotid Sinus Denervation.—Follow-up of 10 patients with typical bulbospinal myasthenia and 3 with ophthalmoplegic myasthenia subjected to carotid sinus denervation showed one patient cured, 7 improved (3 considerably), and 5 not benefited. A patient with residual symptoms, however slight, cannot be considered completely cured, because such symptoms may be indicative of a latent condition with evolutionary potentialities. No residual symptoms could be detected on neurological examination of the patient considered cured. Within six months after the intervention, which was bilateral, he was able to discontinue ingestion of prostigmine, and one month later he resumed an active life as an army officer. Residual myasthenia, though compatible with a normal or nearly normal life either without prostigmine therapy or with small doses for maintenance, usually deprives the patient of the capacity for great muscular effort, and severe failure may occur if overwork is suddenly imposed on the weakened bulbar apparatus. Even mild bronchopulmonary infections in myasthenic patients should receive careful attention. Carotid sinus denervation is never an emergency procedure and should not be attempted in all cases. It is indicated chiefly when a patient with generalized myasthenia has persistent bulbar disturbances in spite of rest and doses of prostigmine amounting to more than 10 tablets daily. Insufficient regression after stabilization with prostigmine and frequent acute attacks are also indications for the procedure. Denervation may be associated with operative removal of an intrathoracic or thymic tumor, either as a preparatory step to lessen the operative risks or later if the tumor proves malignant or the myasthenia remains unchanged after temporary regression. Denervation may be unilateral or bilateral, with a variable interval between the two interventions. Local anesthesia should be used exclusively, and a mechanical respiratory apparatus should be ready for use during the procedure if needed. The optimal dose of prostigmine is determined by preoperative study of the patient and is routinely increased by one-third on the day of the operation and for three days thereafter, even in the absence of symptoms.

Journal Nat. Cancer Inst., Washington, D. C.

13:1399-1528 (June) 1953. **Partial Index**

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Protecting Action of Citrate on Agent of Chicken Tumor I (Rous Sarcoma Virus) During Roentgen Radiation in Vitro. W. R. Bryan, E. Lorenz and D. Calnan.—p. 1447.
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Electron Microscopic Study of Epidermal Carcinoma Induced by Methylcholanthrene in Mouse.. A. von Albertini.—p. 1473.
*Tumors of Urinary Bladder, Gall Bladder, and Liver in Dogs Fed o-Aminoazotoluene or p-Dimethylaminoazobenzene. A. A. Nelson and G. Woodard.—p. 1497.

Tumors in Dogs Fed *o*-Aminoazotoluene or *p*-Dimethylaminoazobenzene.—While *o*-aminoazotoluene and *p*-dimethylaminoazobenzene were known to produce tumors in rats and mice,

a carcinogenic action in dogs had not been previously reported. Of five dogs fed 5 mg. per kilogram of body weight per day of *o*-aminoazotoluene, one died without tumor after four months; the others were fed for 30 to 62 months, and all four of these had tumors. Two had tumors in the urinary bladder and two had tumors in the liver and gallbladder. At a dosage level of 20 mg. per kilogram per day of the same compound, all of five dogs died within eight weeks, principally from liver damage, without tumor. Of 10 dogs fed 20 mg. per kilogram per day of *p*-dimethylaminoazobenzene, eight died within 16 months, without tumor. The remaining two showed bladder tumors after 38 and 48 months, respectively. At a dosage of 5 mg. per kilogram per day of the same compound, none of six dogs fed for 63 months and none of three that died earlier had tumors. The two dyes were among nine different aromatic amines (studied because they were possible food contaminants) and food dyes whose chronic toxicity was being investigated.

Journal of Nervous and Mental Disease, New York

116:469-1124 (Dec.) 1952. **Partial Index**

Robert Wartenberg the Neurologist. F. Schiller.—p. 480.
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Cellular Pathology of Nucleus Basalis in Schizophrenia. K. von Buttlar-Brentano.—p. 646.
*Cerebral Injuries Caused by Atomic Bombardment. Y. Uchimura and H. Shiraki.—p. 654.
Problems of Demyelinating Encephalomyelitis. H. Pette.—p. 673.
Cerebral Paragonimiasis: Neurosurgical Problem in Far East. T. Mitsuno, T. A. Sikô, K. Inanaga and L. E. Zimmerman.—p. 685.
Poliomyelitis: VII. Gastro-Intestinal Disturbances: Their Relationship to Lesions in Hypothalamus. A. B. Baker, I. A. Brown and S. Cornwell.—p. 715.
Topographic Oncology of Cerebral Growths. B. Ostertag.—p. 726.
*Fatal Complications from Use of Diodrast for Cerebral and Thyroid Angiography: Clinico-Pathological Report of Four Cases. R. A. Utterback and W. Haymaker.—p. 739.
Remarks on Treatment of Pituitary Tumors: Indications and Results. H. C. Naffziger.—p. 760.
Cerebral Pedunculotomy for Relief of Involuntary Movements: II. Parkinsonian Tremor. A. E. Walker.—p. 766.
Agoraphobic Vertigo: With Consideration of Nature of Ménière's Vertigo. J. J. Lopez-Ibor.—p. 794.
Hydatid Disease of Spinal Column. A. H. Schroeder and J. Medoc. —p. 1025.

Cerebral Injuries from Atomic Bombardment.—The 37 brains studied by Uchimura and Shiraki were from victims of the atomic bomb explosions at Hiroshima and Nagasaki. The patients died from 19 to 64 days after the explosion. The group included none who either died very early or after a protracted course of illness. Two-thirds of the patients were less than 30 years of age. Severe changes were found in 32 of the 37 cases. On the basis of the pathological changes, two groups could be distinguished: the first showed changes due to circulatory disturbances comparable to those which have been described as the result of excessive doses of radium and roentgen radiation but with certain deviations from the known forms of radiation damage. The second group showed severe selective changes and even destruction of nerve cells.

Fatal Complications from Use of Iodopyracet for Angiography.—Four cases are reported in which the use of iodopyracet (Diodrast) for angiography proved fatal. There were manifestations of severe damage to the central nervous system immediately after the iodopyracet had been injected. Death occurred in 40 hours, 3 days, 10 days, and 10 days respectively. In the one case in which thyroid angiography had been performed, the iodopyracet reached the brain by way of the vertebral artery. In the other three cases cerebral angiography was performed; postmortem examination revealed an old calcified cortical scar in one, a berry aneurysm of the circle of Willis and old cerebral infarction in another, while in the third no cause was found for the signs and symptoms occurring prior to angiography. Infarction of the brain was observed in all four cases. There was evidence to indicate that the infarction was the consequence of vascular changes chemically induced by the iodopyracet.

Journal of Neurosurgery, Springfield, Ill.

10:205-330 (May) 1953

Persistent Carotid-Basilar Anastomosis: Three Arteriographically Demonstrated Cases with One Anatomical Specimen. C. R. Harrison and C. Luttrell.—p. 205.
Pathology of Human Striated Muscle Following Denervation. R. B. Aird and H. C. Naffziger.—p. 216.
Tracheotomy in Neurosurgery. R. H. Dunsmore, W. B. Scoville, F. Reilly and B. B. Whitcomb.—p. 228.
Leptomeningeal Cysts of Brain Following Trauma with Erosion of Skull: Study of Seven Cases Treated by Surgery. J. M. Taveras and J. Ransohoff.—p. 233.
Colloid Cysts of Third Ventricle: Report of Seven Cases. J. L. Poppen, V. Reyes and G. Horrax.—p. 242.
Post-Traumatic Pulsating Exophthalmos Caused by Perforation of an Eroded Orbital Roof by Hydrocephalic Brain. H. Verbiest.—p. 264.
Controlled Hypotension. M. S. Sadove, G. M. Wyant, L. A. Gittelson and P. C. Bucy.—p. 272.
Pneumoencephalography in Chromophobe Adenomas of Hypophysis. L. Bakay and J. C. White.—p. 284.
Surgery of Cranium Bifidum and Spina Bifida: Follow-Up Report of 64 Cases. G. A. Cohn and W. B. Hamby.—p. 297.
*Experiences with Hypophysectomy in Man. R. Luft and H. Olivecrona. —p. 301.

Hypophysectomy in Man.—The authors report on 26 hypophysectomies. Three of the patients had Cushing's syndrome, 7 malignant hypertension, 4 diabetes mellitus, and 12 malignant tumors. Coagulation of the pituitary was done in two of the three patients with Cushing's syndrome and partial resection of the gland in one. Rapid improvement resulted from coagulation in one patient, who was well 15 months after the operation and had even become pregnant. The two other patients died within the first three postoperative days. Results of hypophysectomy in the patients with malignant hypertension were disappointing; five patients died of an extradural clot, subdural hematoma, or acute cerebral edema within the first few postoperative days. The two patients who stood the operation best died of uremia two and five months after the operation. One of the four patients with diabetes mellitus made an uneventful recovery and now requires 12 units of insulin instead of the 80 units required before the operation. The other three patients died within the first few postoperative days. Acute cerebral edema after hypophysectomy appears to occur only in patients with diabetes mellitus, Cushing's syndrome, and malignant hypertension. This reaction did not occur, at least not in a violent form, after hypophysectomy in patients with malignant tumors. Of these 12 patients, 1 had carcinoma of the prostate gland, 1 malignant chorionepithelioma, 1 hypernephroma, and 9 carcinoma of the breast. Difficulties of urination and defecation disappeared for three months after incomplete hypophysectomy in the patient with cancer of the prostate gland. Relief of pain lasted until his death, which occurred four months after the operation. The patient with hypernephroma tolerated the hypophysectomy well, but the disease was progressing three months after the operation. The patient with malignant chorionepithelioma was temporarily improved for four months after the operation, but died six months after the operation. In the nine patients with carcinoma of the breast the disease was advanced, with large recurrences after previous mastectomies and with pulmonary and other metastatic lesions. Follow-up after hypophysectomy has been too short to permit any conclusion concerning the effect of the operation on the cancer. The authors' experience indicates that hypophysectomy is well tolerated, that reactions similar to those observed in endocrine disorders and malignant hypertension do not occur, and that unless hypophysectomy is complete only a temporary effect of short duration is to be expected. When the hypophysectomy is complete, as it was in a 49-year-old woman, a remarkable regression of the carcinoma may occur, although the authors do not know how long this improvement is going to last. They believe that carcinomas of the breast and possibly also of the prostate, as well as chorionic epitheliomas in a stage when other methods of treatment are no longer effective, offer a promising field for hypophysectomy.

Journal of Nutrition, Philadelphia

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Comparison of Chemical Analysis and Bioassay as Measures of Vitamin A Value: Yellow Corn Meal. E. C. Callison, L. F. Hallman, W. F. Martin and E. Orent-Keiles.—p. 85.
Studies on Reversal of Aminopterin Toxicity in Rat with Citrovorum Factor, Folacin and Related Compounds. H. E. Sauberlich.—p. 101.
Nutritional Deficiencies in Mice Caused by Stress Agents. D. K. Bosshardt and J. W. Huff.—p. 117.
Effect of Dietary Amino Acid Levels Upon Oxidation of L- and D-Amino Acids by Kidney Tissue. A. L. Sheffner and O. Bergeim.—p. 141.

Journal of the Student A.M.A., Chicago

2:1-88 (June) 1953. **Partial Index**

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Journal of Urology, Baltimore

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Bilateral Giant Hydronephrosis. D. M. Davis.—p. 739.
*Streptomycin, PAS and Isoniazid in Renal Tuberculosis. J. K. Lattimer, F. Lerman, P. Lerman and L. L. Spivack.—p. 745.
New Type of Artificial Kidney: II. Treatment of Acute and Chronic Uremia. G. Hollander, J. A. Sterling and J. C. Doane.—p. 753.
Spontaneous Nephroduodenal Fistula: Review of Literature and Report of Case. G. H. Jones, O. A. Melendy and W. F. Flynn.—p. 760.
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Bilateral Ureteral Obstruction Due to Envelopment and Compression by Inflammatory Retroperitoneal Process. E. O. Bradfield.—p. 769.
Accidental Injury to Ureters and Bladder in Pelvic Surgery. P. W. Aschner.—p. 774.
Clinical Effect of Pituitary Adrenocorticotrophic Hormone in Three Cases of Severe Chronic Interstitial Cystitis. A. J. Paquin and V. F. Marshall.—p. 787.
*Carcinoma of Prostate: Results of Total Prostatectomy. F. H. Colby.—p. 797.
*Erythroplasia of Queyrat. J. W. Merricks and T. L. C. Cottrell.—p. 807.
*Queyrat's Erythroplasia with Carcinomatous Invasion: Report of Unusual Case. S. Friedman.—p. 813.
Acute Scrotal Appendicitis. S. W. Mulholland, H. M. Madonna and D. A. Cornely.—p. 815.
Spermatic Granuloma of Epididymis: Case Report. I. T. Rieger and R. H. Fuller.—p. 819.
Leiomyosarcoma of Spermatic Cord. H. N. Wessel.—p. 823.
Infarct of Testicle: Report of Three Cases. G. A. Winstead.—p. 830.
Torsion of Hydatid of Morgagni. B. E. Fillis and W. C. Meyer.—p. 836.
Radioresistant Testis Tumors: Results in 133 Cases; Five-Year Follow-Up. L. G. Lewis.—p. 841.
Malignant Testis Tumor with Hepatic Metastasis in Grizzly Bear. W. E. Goodwin, J. N. deKlerk and D. C. McGoon.—p. 845.
Urokon Sodium 70 Per Cent in Excretory Urography. C. N. Barry and D. K. Rose.—p. 849.

Chemotherapy in Renal Tuberculosis.—A total of 458 patients with genitourinary tuberculosis have been treated with chemotherapy alone by the research group of the Veterans Administration. The objective was to determine the optimum long-range dosage plan for streptomycin and other new antituberculosis drugs. This study has now been in progress for five years. Streptomycin and *p*-aminosalicylic acid were effective in slowing the progress of the disease, even when the urine could not be sterilized. Inoperable, bilateral renal tuberculosis was treated with from one to three years of intermittent combined therapy (12 gm. of *p*-aminosalicylic acid daily, plus 1 gm. of streptomycin two times per week). Unilateral, destructive renal tuberculosis, with visible x-ray changes and with the contralateral kidney showing no pus cells and no tubercle bacilli in the ureteral urine, was treated by nephrectomy. In occasional cases partial nephrectomy proved practical when combined with chemotherapy. Chemotherapy was continued after operations until pyuria ceased. Isoniazid improves the bladder lesions of renal tuberculosis, and the urine culture becomes negative in some patients. Limitations of isoniazid appear to be the same as those of streptomycin if the drug is used alone. Drug resistance may develop after from four to eight weeks, and the urine from large necrotic kidney lesions cannot always be sterilized. In patients with nitrogen retention isoniazid accumulates in the blood, and blood levels should be ascertained in order to prevent convulsions. Hyper-reflexia is not a true index to the blood level and cannot be depended on as a warning sign of impending toxicity. When blood levels can be determined, this drug can be an important addition to the treatment of even uremic patients with massive kidney lesions. Drug resistance was the most important limiting factor in the effectiveness of streptomycin, *p*-aminosalicylic acid, and isoniazid. Since the mode of action of all three drugs appears to be different, it is reasonable to assume that a combination may greatly increase their effectiveness and further defer the development of drug resistance. Five years of follow-up studies appeared to justify the conclusion that modern chemotherapy can at least modify the lethal course of renal tuberculosis.

Total Prostatectomy in Carcinoma of Prostate.—Castration and the estrogens have had a profound effect upon cancer of the prostate but there is little evidence that these measures are curative. A fair comparison between results of estrogen therapy and radical surgery is difficult, because antiandrogenic therapy has been applied to many stages of cancer, whereas total prostatectomy has been used only in cases in which the cancer was localized to small areas within the gland or the lesion appeared to be confined to the capsule of the gland. One hundred total prostatectomies performed at the Massachusetts General Hospital during the past 20 years for suspected cancer were reviewed. In spite of clinical evidence that cancer was present, no malignant disease existed in 21 of these patients. It should be recognized that early cancer of the prostate produces no symptoms. Symptoms present when the cancer is in an early stage usually are due to associated benign hypertrophy. Rectal examination gave correct diagnostic information in 73 of the 100 cases; in the remaining 27 it was misleading. Results of cytological examination of expressed prostatic secretion were confirmed in only about 40% of the cases. The most that can be said for needle biopsy is that when the specimen contains malignant cells, the patient does have cancer. Perineal biopsy and examination of frozen sections proved the most dependable and accurate diagnostic procedure. The operative technique of Young was generally used. The operative mortality was 5%. Of the 41 patients who underwent total prostatectomy before 1949, 26, or nearly two-thirds, were clinically free of disease at the end of three years. Fifteen of the 29 patients were alive and clinically free of disease five years after total prostatectomy. One was living with possible recurrence. Ten had died of cancer. Only one of the 15 five year survivors had subsequently died of cancer at the time of writing, and he died six years after operation. Total prostatectomy is gaining in favor. At the author's clinic nearly four times as many of these operations have been performed during the past 10 years as during the previous decade. He feels that the functional results justify the procedure.

Erythroplasia of Queyrat.—According to Merricks and Cottrell, Queyrat's erythroplasia usually involves the glans penis, but it may involve the coronal sulcus and the prepuce. It is of a chronic nature and is characterized by the persistence of slightly sensitive red plaques lightly infiltrating the mucous membranes. The majority of authors consider the cause unknown, although irritation, trauma with or without scar formation, inflammation, and syphilis have been postulated as predisposing factors. The disease is comparatively rare, the world literature reporting a total of 260 cases, to which these authors add a new case. A 79-year-old man complained of gradual tightening of the foreskin for the previous three years. During this time two paraphimotic episodes had occurred. Circumcision had been refused twice. At examination the foreskin could not be retracted and was becoming increasingly tender. Circumcision by the dorsal slit, lateral flap method was performed. Dense adhesions were encountered in freeing the prepuce, revealing an ulcerated glans. The glans was slow to heal. After 22 days the patient was discharged. During the next six months various ointments and chemicals failed to bring about complete healing. A biopsy taken at this time revealed Queyrat's erythroplasia and suggested malignant degeneration. Most authors consider this lesion precancerous or malignant, since degeneration into malignant epitheliomas occurs in 20 to 40% of the cases. In the case

reported here the penis was amputated five months after the circumcision. The surgical specimen indicated a transitional cell carcinoma developing from Queyrat's erythroplasia. Amputation is the only adequate treatment for an advanced lesion.

Case of Queyrat's Erythroplasia.—A 39-year-old man had a small lesion on the left dorsal surface of the mucosal aspect of the prepuce for 10 years that had resisted local therapy. The lesion consisted of an oval, slightly elevated, orange-brown area 1.5 cm. long, with tiny, hard smooth papillary projections and multiple longitudinal fissures that burned and opened from time to time. The patient was circumcised well outside the pathological area, insuring eradication. The postoperative course was uneventful. The author stresses that Queyrat's erythroplasia is a serious disease and that therapy must be governed accordingly.

Louisiana State Medical Society Journal, New Orleans

105:171-210 (May) 1953

Magnamycin in Acute Amebic Colitis. W. A. Sodeman and R. C. Jung.—p. 171.
Clinical Trial with Testosterone Cyclopentylpropionate. W. A. Reed and J. F. Lally Jr.—p. 172.
Evaluation of Newer Anticholinergics in Gastroenterology: Secretory, Motility, and Clinical Studies on Darstine, Pamine, and Reltine. G. McHardy, J. E. Bechtold and D. C. Browne.—p. 174.
Training for Practice of Surgery. J. D. Rives.—p. 181.
Polycythemia Vera with Gastroscopic Observation. D. N. Silverman and M. Dale.—p. 186.
Medical Slide Rule Especially Designed for Medical and Physiological Laboratories. J. T. Peters.—p. 188.
The Cross-Eyed Child: Etiologic Factors in His Defect. G. M. Haik and G. Ellis.—p. 191.
Diaphragmatic Hernia Through Foramen of Bochdalek in Newborn Infant. F. M. Smith Jr.—p. 194.
As a Layman Sees It. J. Y. Bowen.—p. 198.

Maine Medical Association Journal, Portland

44:113-142 (May) 1953

Surgical Treatment of Cancer of Cervix. T. G. Harvey.—p. 117.
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Evaluation of Chest X-Ray Survey Programs in Maine Hospitals. A. Ashley.—p. 123.

44:143-182 (June) 1953

Men in Medicine in Eastern Maine During the Early Days. R. C. Wadsworth.—p. 150.
Dr. Samuel Merritt: Saga of a Physician from Maine. G. O. Cummings.—p. 159.
Anecdotes from the St. John River Valley. A. Albert.—p. 161.

Military Surgeon, Washington, D. C.

112:395-472 (June) 1953. **Partial Index**

Radiobiology: Irradiation Lethality and Protection. R. Rugh.—p. 395.
Chest Surgery in Korean Campaign. R. B. Brown.—p. 417.
Project to Block Progress in Jungle Yellow Fever in Northern Honduras, and Calculated Risks of Failure. N. W. Elton.—p. 424.
Early Management of Facial Injuries. R. L. Harding.—p. 434.

Minnesota Medicine, St. Paul

36:433-568 (May) 1953

Civil Defense: Report to Membership. J. H. Tillisch and J. T. Smiley.—p. 457.
*Brucellosis in Man: Study of 35 Cases Due to Brucella Abortus. W. H. Hall.—p. 460.
*Antibiotic Therapy in Bacterial Endocarditis: III. Penicillin O and Hypoallergenic Penicillins in Treatment of Subacute Bacterial Endocarditis. J. E. Geraci and P. R. Manning.—p. 466.
Look Backward. O. H. Wangensteen.—p. 471.
Study of Masses in Right Lower Quadrant of Abdomen. J. D. Mortensen and J. A. Bargen.—p. 481.
Analysis of Tuberculosis Case Registers in Minnesota. D. S. Fleming.—p. 486.
Obscure Fever of Hypernephroma. L. V. Kragh, H. H. Joffe, A. H. Wells and R. J. Eckman.—p. 488.

Brucellosis in Man.—The occurrence of Brucella abortus (brucellosis) is reported in 35 men between the ages of 21 and 59 years. There were 13 farmers who owned cows affected with Bang's disease, 15 packing plant employees, 1 veterinarian, and 6 who had no direct animal contacts, but 5 of these consumed unpasteurized milk or cheese and one often repaired radios covered with manure. Symptoms of the disease were multiple and varied. Clear-cut symptoms relating to the digestive or respiratory system were usually lacking. Physical abnormalities such as fever, lymphadenopathy, weight loss, and enlargement of the spleen and liver were few and inconclusive. Br. abortus was isolated from the blood of every patient. All had serum agglutinins ranging in titer from 1:160 to 1:5,120. The diagnosis rested principally on the epidemiological and clinical history, the agglutination test, and the blood culture. Only the last was decisive. Aureomycin in doses of 2 gm. daily for 7 to 21 days proved to be the most satisfactory therapeutic agent. There seemed to be no advantage in adding streptomycin or dihydrostreptomycin. Corticotropin (ACTH) controlled fever and toxicity but not bacteremia. Corticotropin may be a useful adjunct to chemotherapy in critically ill patients. Since human brucellosis can nearly always be traced to an animal source, control of the human disease depends primarily on the extermination of the animal reservoir. Pasteurization of milk and other dairy products is helpful but will not eliminate human brucellosis.

Antibiotic Therapy in Bacterial Endocarditis.—Two men and one woman with subacute bacterial endocarditis and histories of previous severe reactions to penicillin G were successfully treated with penicillin O in doses of 600,000 to 3,000,000 units per day. All three patients had mild sensitivity reactions to penicillin O, but the erythematous maculopapular rash, exfoliative reaction, and urticaria were not severe enough to warrant cessation of administration of this form of penicillin. Penicillin G was administered subsequently in gradually increasing doses, up to 10 million units per day in two of the authors' three patients, without any untoward reactions. Antihistaminic drugs were used in all three patients in an attempt to minimize the extent of reactions. The considerably milder nature of the reactions with penicillin O indicates that the latter form of penicillin was of benefit in the treatment of these patients. While it is evident that penicillin O is not the final answer to the problem of sensitivity to penicillin, it offers one more approach to the treatment of patients with subacute bacterial endocarditis who are sensitive to penicillin G and in whom use of penicillin is indicated.

New England Journal of Medicine, Boston

248:875-918 (May 21) 1953

Medicine and the Doctor in Work and Epigram. S. M. Jordan.—p. 875.
Use of Diamox, a Carbonic Anhydrase Inhibitor, as an Oral Diuretic in Patients with Congestive Heart Failure. C. K. Friedberg, R. Taymor, J. B. Minor and M. Halpern.—p. 883.
Massive Mesenteric Infarction Following Inferior Mesenteric-Artery Ligation in Resection of Colon for Carcinoma. R. S. Shaw and T. H. Green Jr.—p. 890.
Ectopic Pregnancy Occurring in Right Inguinal Canal. A. A. Levi.—p. 892.
Medical Management of Arterial Hypertension. E. Meilman.—p. 894.

248:919-958 (May 28) 1953

Some Problems of Soviet Medical Practice: Sociological Approach. M. G. Field.—p. 919.
*Pancreaticoduodenal Cancer. W. V. McDermott Jr. and M. K. Bartlett.—p. 927.
Treatment of Respiratory Acidosis with N-Allylnormorphine (Nalline). M. J. Dulfano, F. X. Mack and M. S. Segal.—p. 931.
Hypercalcemia of Sarcoid Corrected with Cortisone. R. W. Phillips.—p. 934.
Medical Management of Arterial Hypertension. E. Meilman.—p. 936.

Pancreaticoduodenal Cancer.—The term pancreaticoduodenal cancer includes tumors of the head of the pancreas, the ampulla of Vater, the common bile duct, and the duodenum. All these cancers have in common the fact that a relatively standardized operation, pancreaticoduodenectomy, has been employed in their removal. This paper presents the results of radical resection of pancreaticoduodenal carcinoma. The authors compare the results of both curative and palliative surgical treatment in the 183 patients treated during the last decade (1941-1950) with the clinical course of the same types of carcinoma in 132 patients treated during the preceding decade (1931-1940). In the first decade only palliative surgery was employed regardless of the size of the tumor, duration of symptoms, or condition of the patient. The conclusion drawn from the comparison of these two groups is that little

or nothing has been accomplished by pancreaticoduodenectomy if the results are viewed from the standpoint of over-all salvage. In some cases radical resection has been of palliative value and, in a still smaller group, has achieved five year survival and possibly permanent eradication of the disease. Therefore, even on the basis of these discouraging statistics, one should not advocate abandonment of pancreaticoduodenectomy, even in cancer of the head of the pancreas, which has the most unfavorable prognosis. Cancer of the duodenum seems to carry a relatively more favorable prognosis. The authors feel that recently described methods of resection of the portal vein and accompanying lymphatics may improve the results of radical surgical removal of these tumors.

Ohio State Medical Journal, Columbus

49:473-584 (June) 1953

Improving Rate of Cure in Cervical Carcinoma. A. C. Barnes and C. H. Hendricks.—p. 493.
Treatment of Sterility—Practical Considerations. M. Douglass.—p. 496.
Use of ACTH in Case of Friedlander's Pneumonia. H. E. May.—p. 501.
Embolectomy Combined with Retrograde Milking. B. Seligman.—p. 503.
Angiomas: Dermatologist's Views. S. R. Mercer.—p. 505.
Large Twins—Case Report with Review of Other Cases. A. Woodburn. —p. 506.
Difficulties in Evaluation of Results of Psychotherapy and Implications for Referring Physicians. B. S. Matthews.—p. 507.

Oklahoma State Medical Assn. Journal, Oklahoma City

46:107-140 (May) 1953

Voice Therapy for Hoarse Voice. J. L. Boland Jr.—p. 109.
Diagnosis of Ocular Headache. R. Wyrick.—p. 114.
Report on Maternal Mortality 1951. C. E. Green.—p. 116.
Fireworks Casualties: Preventable Cause of Damage, Disability and Death. E. C. Reifenstein Jr.—p. 122.

46:141-166 (June) 1953

Management of Neurogenic Bladders from Rehabilitation Standpoint. J. W. Deyton.—p. 144.
Contraindications to Use of Banthine in Duodenal Ulcer. J. R. Colvert. —p. 149.

Physiological Reviews, Baltimore

33:145-244 (April) 1953

Physiology of D-Amino Acids. C. P. Berg.—p. 145.
X-Ray Methods in Histochemistry. A. Engström.—p. 190.
Volume and Distribution of Blood and Their Significance in Regulating Circulation. T. Sjörstrand.—p. 202.
Biochemistry and Physiology of Epidermis. C. Carruthers and V. Suntzeff. —p. 229.

Proc. Soc. Exper. Biol. & Med., Utica, N. Y.

83:1-194 (May) 1953. **Partial Index**

*Skim Milk and Experimental Rat Caries. F. J. McClure and J. E. Folk. —p. 21.
Steroid Compounds Resulting from Incubation of Cortisone with Surviving Liver Slices. A. B. Eisenstein.—p. 27.
Surface Fixation as Practical Method for Diagnosis of Brucellosis in Man and Animals. M. R. Castaneda.—p. 36.
Effect of Aureomycin in Rats with Chronic Alloxan Diabetes. A. M. Cohen and M. Rachmilewitz.—p. 50.
Effect of Somatotrophic Hormone and Streptomycin on Mice Exposed to Total Body X-Irradiation. L. E. Gordon, C. P. Miller and H. J. Hahne.—p. 85.
*Effects of Mineral Deficiencies on Amino Acid Utilization: Critical Role of Potassium and Phosphorus. D. V. Frost and H. R. Sandy.—p. 102.
Isolation and Purification of Plasma Thromboplastin: Its Physico-Chemical and Biologic Properties. E. W. Campbell and M. Stefanini.—p. 105.
Certain Physical Properties of Herpangina Strain and Pleurodynia Strain of Coxsackie Virus. S. S. Breese Jr. and A. Briefs.—p. 119.
Prevention of Blood Coagulation by Antibiotics in Vitro. A. I. Braude, P. Davey and J. Siemienski.—p. 160.
Hemagglutination with Certain Arthropod-Borne Viruses. J. Casals and L. V. Brown.—p. 170.
Failure of Rutin and Catechin to Affect Vascular Lesions of Experimental Hypertension or Hypersensitivity. J. L. Orbison and E. Peters.—p. 173.
Suppression of Normal Bactericidal Action of Rabbit Serum Following Whole Body X-Irradiation. S. Marcus and D. M. Donaldson.—p. 184.

Skim Milk Powders and Experimental Caries.—Previous studies on experimental rat caries suggested the possibility of a relation between heat-processed cereal foods and the etiology of dental caries. Continuing this type of study, the cariogenic role of heat-processed skim milk powders was investigated. Diets containing 35% of commercial skim milk powders prepared by the usual spray and roller processing and also given a subsequent heat treatment prior to feeding have been identified with the production of a specific type of surface caries in white rats. The extent and severity of the caries was significantly and consistently increased by heat treatment of these commercial skim milk powders. The results suggest that a cariogenic effect may be produced by heat treatment of dry skim milk powders. According to present evidence, this cariogenic effect has not been identified with the nutritive growth failures usually associated with heat or storage deterioration of milk proteins.

Effects of Mineral Deficiencies on Amino Acid Utilization.—Results of studies presented in this paper point to the critical role of potassium in amino acid utilization following protein depletion. Rats depleted only of protein failed completely, even when offered a complete source of amino acids, if at the same time potassium was withheld. If phosphorus was withheld during the repletion period, the rate of recovery was slower, but complete failure and deaths did not result as with potassium deprivation. Deprivation of sodium, calcium, or magnesium did not appear to have immediate limiting effects on the appetite of protein-depleted rats for a complete amino acid source or on their ability to recover lost weight.

Public Health Reports, Washington, D. C.

68:549-640 (June) 1953. **Partial Index**

Medical Education Scholarship Loans in the Mississippi Integrated Health Program. F. J. Underwood.—p. 549.
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Interest of Public Health in Diabetes. M. J. Ford.—p. 624.

Texas State Journal of Medicine, Fort Worth

49:271-350 (May) 1953

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Outline of History of Obstetrics and Gynecology. W. R. Cooke.—p. 295.
Eye, Ear, Nose, and Throat as Specialty in Texas in Past Century. E. H. Cary.—p. 298.
Century of Progress in Medicine in Texas: Radiology. R. T. Wilson. —p. 301.
One Hundred Years of Health Guardianship and Health Progress in Texas. H. A. Kemp.—p. 308.
One Hundred Years of Progress in Pathology in Texas. B. F. Stout. —p. 312.
Pediatric History in Texas. F. H. Lancaster.—p. 316.
Medical Education in Texas. M. O. Rouse.—p. 320.
Century of Progress in Laws of Texas Relating to Medicine and Public Health. P. R. Overton.—p. 323.

U. S. Armed Forces Med. J., Washington, D. C.

4:467-638 (April) 1953

Surgical Management of Bronchiectasis: Review Based on Analysis of 100 Consecutive Resections. C. F. Storey and E. G. Laforet.—p. 469.
Psychotherapy with Combat Fliers. R. J. Lifton.—p. 525.
Painless Myocardial Infarction. F. B. Rogers.—p. 533.
Bacteriologic Diagnosis of Enteric Infections. A. V. Hardy, R. P. Mason, D. Hamerick and R. B. Mitchell.—p. 541.
Elective Induction of Labor: Using Oxytocin Injection Intravenously. P. M. Gold and J. H. Angell.—p. 555.
Rates of Wound Healing: When Standard and Experimental Burn Dressings Were Used. D. S. J. Choy.—p. 559.
Use and Misuse of Dermatologic Preparations. W. R. Walsh.—p. 563.
Treatment of Rhus Dermatitis: Ineffectiveness of Cortisone. R. J. Hoagland.—p. 581.
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Extensive Rupture of Spleen with Delayed Signs of Hemorrhage. C. Atamian, J. McFarlane and H. S. Blake.—p. 603.
Treatment of Exfoliative Dermatitis with Cortisone. D. M. Koppel. —p. 607.
Shadow of Antral Portion of Stomach Simulating Soft Tissue Tumefaction. P. A. Paden and H. Shapiro.—p. 631.

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British Journal of Radiology, London

26:217-272 (May) 1953. **Partial Index**

Diagnostic Radiological Aspects of Hypopharyngeal Cancer. S. Welin. —p. 218.
Whole Body Irradiation—Radiobiology or Medicine? R. H. Mole.—p. 234.
Radiological Diagnosis of Mitral Valve Disease. J. Kaye, M. J. Meyer, B. van Lingen and others.—p. 242.
Treatment of Cancer of Cervix Uteri—Revised "Manchester Method." M. Tod and W. J. Meredith.—p. 252.
High-Resolution X Radiography. V. E. Cosslett.—p. 258.
Radiation Monitoring in Hospitals of Great Britain. J. R. Greening. —p. 261.

Deutsche medizinische Wochenschrift, Stuttgart

78:799-830 (May 29) 1953. **Partial Index**

Pharmacological Viewpoints Concerning Treatment of Acute Poisoning. L. Lendle.—p. 799.
Disadvantages of Hormone Therapy. H. G. Fassbender.—p. 803.
*Treatment of Myasthenia Gravis: Clinical Experiences Concerning Treatment of Pseudoparalytic Myasthenia Gravis with Pyridostigmine. P. Seibert.—p. 805.
Development and More Recent Results of Allergy Theory. K. Hansen. —p. 807.
Neurotoxic Reaction to Penicillin. P. Bockel.—p. 810.

Treatment of Myasthenia Gravis.—Since 1948, a pyridine homologue of neostigmine (Pyridostigmine), was given a therapeutic trial in 23 patients with myasthenia gravis associated with pseudoparalysis. Results of animal experiments, which have not yet been published, showed that Pyridostigmine is five times less toxic than neostigmine, while the effect of the new preparation on the isolated intestine in vitro and in situ is only half that of neostigmine. Most of the author's patients had been treated previously with neostigmine, but there was only little improvement and the drug was not well tolerated. Result of treatment with Pyridostigmine showed that the effect of the drug on the muscles was prolonged, so that single doses of the drug could be given at longer intervals. The improvement of the functional capacity of the muscles was definitely superior to that obtained with neostigmine. The muscles of the trunk and of the extremities were most favorably affected by Pyridostigmine; the drug was least effective with respect to the external muscles of the eye. Undesirable side-effects were rare and mild. It was possible to administer large doses of the drug for prolonged periods. The dose required varied with the individual patient; while in some patients 4 tablets daily were sufficient, 12 tablets daily were required in other patients. Results with Pyridostigmine were definitely superior to those obtained with neostigmine as far as improvement of symptoms was concerned. A cure of the disease, however, could not be accomplished with Pyridostigmine.

Nordisk Medicin, Stockholm

49:599-632 (April 24) 1953. **Partial Index**

*Indications, Technique and Prognosis in Arthroplasty of Hip Joint. A. Westerborn.—p. 603.
Purulent Osteomyelitis of Spine: Seven Cases Treated with Penicillin. A. Hjelde and T. Hortemo.—p. 608.
Innervation of Heart and Operations on Nerves of Heart. M. Knudsen. —p. 610.
*Bundle Branch Block: Analysis of 100 Cases. B. G. Lundh.—p. 615.
Ruptures Involving Knee. R. Bromö.—p. 618.

Indications, Technique, and Prognosis in Arthroplasty of Hip Joint.—In Westerborn's opinion the results of arthroplasty of the hip joint by the Smith-Petersen technique justify the procedure, and the same is probably true of Judet's operation. In Sahlgren Hospital arthroplasty was performed in about 200 cases from 1947 to 1951. Follow-up examination revealed a high percentage of good late results of the Smith-Petersen operation; Judet's method with an acrylic substance has been in use only the last two years. Patients treated by Judet's operation have on the whole been less affected by the operation, and the immediate results have been satisfactory in most cases. After Smith-Petersen's cup plasty a number of patients have been able to resume occupations involving heavy physical work. Light work is advised for the first two years if possible. Reschooling for unskilled workers not too old to learn to do lighter work might be advisable. The main indications for arthroplasty of the hip joint are osteoarthritis, deforming arthritis of different origins, subluxations, and sequelae of loosening of epiphysis, Perthes disease, pseudoarthrosis, and necrosis of the head of the femur. Special indications for Judet's method include osteoarthritis with marked cystic degeneration of the head, necrosis of the head of the femur, pseudoarthroses, and certain fractures of the neck of the femur. Satisfactory results depend on thorough and careful technique and careful selection of patients; prolonged aftercare and training are fundamental, and the patient's active cooperation is essential. The results are mainly endangered by formation of new bone. The best results are attained in young and middle-aged patients who are not greatly overweight. Heavy and indolent persons are poorly adapted for the intervention. Evaluation, however, must be done in the individual case. Age plays a less important part than the general condition.

Bundle Branch Block.—From 1942 to 1951, 100 cases of bundle branch block, in 61 men and 39 women, were diagnosed. Four forms were seen: typical branch block of the right and left sides, Wilson block, and left block of homophasic type. Ninety of the cases represented left bundle branch block. The average age of the patients at the time of diagnosis was 73.1 years; 40 patients were between 70 and 80. Forty-six deaths occurred during the first year after diagnosis. The diagnosis had been made at least five years previously for 15 of the 19 patients still living; one of the three who were still living 10 or more years after the diagnosis was made has been observed for 18½ years. The principal etiological factors are hypertension and coronary occlusion, with resulting enlargement of the heart and fibrosis. Lundh says that, since electrocardiographic examinations are not a routine procedure, many cases of bundle branch block are not discovered. The prognosis follows that of the basic disease. Bundle branch block is not incompatible with long life and some physical activity, but such cases are rare.

Philippine Medical Association Journal, Manila

29:149-198 (April) 1953

Renal Function as Affected by Renal Infection. L. F. Torres Jr.—p. 149.
Diagnostic Problems in Ectopic Pregnancy. G. Tancinco-Yambao and P. M. Cajipe.—p. 154.
Preliminary Study on Use of Pooled Human Plasma (Liquid). R. Y. Atienza, O. Buensucesco and E. G. Bumanglag.—p. 159.
Laboratory Findings in Cases of Food Poisoning. A. P. de Roda.—p. 163.

Practitioner, London

170:441-544 (May) 1953. **Partial Index**

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Cortisone and ACTH in Ophthalmology. W. J. B. Riddell.—p. 452.
Retrolental Fibroplasia. J. H. Doggart.—p. 458.
Treatment of Cataract with Particular Reference to Acrylic Lenses. A. J. B. Goldsmith.—p. 465.
Corneal Grafting. A. M. Reid.—p. 471.
Toxic Amblyopia. G. I. Scott.—p. 480.

Presse Médicale, Paris

61:743-764 (May 23) 1953. **Partial Index**

*Attempts at Correction of Ectopic Aortic Stenosis. J. Patel and J. Facquet.—p. 743.
*Thromboembolic Disease in Patients with Mitral Involvement. R. Raynaud, J. R. d'Eshougues and M. Brochier.—p. 745.
Antibiotics and Synthesis of Vitamin B Complexes: "Chain Selection." J. Brisou.—p. 748.

Ectopic Stenosis of the Aorta.—Only 21 cases of subisthmic, ectopic stenoses of the aorta, either thoracic or abdominal, have hitherto been reported. Many of the earlier cases were diagnosed only at autopsy, but the anomaly can now be demonstrated by angiocardiography. Surgical correction has been attempted in six cases. In five cases the stenosis was in the lower thoracic aorta but above the diaphragm, while in

the sixth case it involved the lower end of the abdominal aorta. Arterial grafts may be successfully used to replace the narrowed segment of the thoracic aorta, but the only method promising a cure in stenosis of the abdominal aorta is the creation of some kind of a shunt to carry the blood from the aorta past the stricture, thus counteracting hypertension. This method was used by the author in the first operation for ectopic aortic stenosis performed in Europe; the splenic artery was successfully anastomosed to the aorta and the postoperative course during the first three days was good. Then, however, the patient's general condition, which was complicated by heart failure and renal impairment, deteriorated, and on the fifth postoperative day she died. Early intervention, before cardiac disturbances associated with increasing hypertension or nephritis have had time to appear, is apparently essential; the procedure, which is at best an artifice, cannot be expected to succeed under any but favorable conditions.

Thromboembolic Disease in Patients with Mitral Involvement.—An impaired mitral valve is not only indicative of rheumatic fever, which may become active again at any time, and a site of predilection for secondary infection but is also an essential factor in the development of thromboembolic disease characterized by fever, repeated emboli, and symptoms of venous thrombosis. The fever is usually constant but moderate, with occasional peaks coinciding with embolic attacks, which may be either pulmonary or arterial. The classical picture of infarct presented in acute episodes of pulmonary embolism is unmistakable; at times, however, the condition may be clinically silent, or the symptoms may be limited to the recurrence of dyspnea, the abrupt appearance of right ventricular failure, or a hemorrhagic, inflammatory pleural effusion. Arterial embolism appears especially at the aortic bifurcation or in the lower limbs; less frequent than pulmonary embolism, it is usually a late manifestation and consequently carries a poor prognosis. Patients with mitral disease should be given routine examinations of the veins of the leg, especially those in the calf, where the earliest signs of thrombosis are found. The symptoms constituting this syndrome are due partly to the hemodynamic disturbances resulting from the valvular defect and partly to the hypercoagulant effect of the drugs used in treating the heart condition (digitalis and mercurial diuretics and even cortisone and corticotropin). The hypercoagulability of the blood may be seen on comparison of the prothrombin rate with the results of in vitro heparin tolerance tests. Transient increases in the alpha and gamma globulin fractions apparently coincide with periods of hepatic congestion and renewed activity of the thrombosing process respectively. Thromboembolic disease usually progresses by repeated embolic attacks, although it may be either acute or chronic. Anticoagulants should be given routinely to all patients in whom mitral affections are complicated by thromboembolic disease; discovery of hypercoagulability in itself constitutes an indication for their use. Patients with cardiac arrhythmias, especially those presenting the syndrome of enlarged left atrium, complete arrhythmia, and fever, should also be given antifibrillant medications such as dihydroquinidine. Excellent results have been obtained in patients treated by this method; embolic attacks ceased and the temperature was immediately reduced when sinus rhythm was restored.

Proceedings of Royal Society of Medicine, London

46:307-406 (May) 1953. **Partial Index**

Nerve Trunks as Pathways in Infection. G. P. Wright.—p. 319.
Recurrent Instability of Ankle—Method of Surgical Treatment D. L. Evans.—p. 343.
Use of Radioactive Phosphorus in Early Detection of Avascular Necrosis in Femoral Head in Fractured Neck of Femur. G. P. Arden and N. Veall.—p. 344.
Correlation Between Changes in Spinal Cord and Muscle Paralysis in Poliomyelitis: Preliminary Report. W. J. W. Sharrard.—p. 346.
Neo-Natal Volkmann's Syndrome. G. M. Bedbrook.—p. 349.
Types of Injury in Run-Over Lower Limbs. R. S. Henderson and L. M. Rouillard.—p. 350.
Tumours of Proximal Limb Bones and Hip Simulating Intervertebral Disc Lesions. J. C. McNeur.—p. 351.

Rivista d'Ostet. e Ginec. Pratica, Milan

35:113-168 (March) 1953. **Partial Index**

Combination of Barbiturates and Curare with Artificial Respiration in Cesarean Section. E. Seassaro.—p. 113.
•Bufo-Reaction with Blood and Urine for Biological Diagnosis of Pregnancy. A. De Marchi and G. Carrain.—p. 125.

Bufo Vulgaris Test for Diagnosis of Pregnancy.—At the obstetric and gynecological clinic of the University of Padua the biological test for pregnancy is made on the Bufo vulgaris toad. This toad reacts well to gonadotropins, is less expensive than the animals that are usually used for this purpose, and can be utilized again four to five days after the test. Another feature of this test is that blood serum rather than urine is utilized. The authors made a comparative study of the results with urine and with blood serum. More accurate, quicker, and more intense results were obtained with the blood serum, probably because of a constant and greater concentration of chorionic gonadotropic hormones in the serum. There were five falsely negative reactions when 2 cc. of the urine from 281 pregnant women were injected into the toads, whereas the reactions were always positive when 2 cc. of the blood serum from 508 pregnant women were injected. There was one falsely positive reaction when 2 cc. of the urine from 10 men were injected into the animals. The response was always negative when either blood serum or urine of nonpregnant women was injected. Thus, the results were accurate in 100% of the cases in which blood serum was used but in only 99.43% of the cases in which urine was used. Acidosis developed frequently after the injection of urine, and the animals died during the experiments. The blood serum, however, proved completely atoxic for the animals.

Schweizerische medizinische Wochenschrift, Basel

83:439-462 (May 9) 1953. **Partial Index**

Significance of Hematogenous or Inoculation Hepatitis in Medical Practice. E. A. Vischer.—p. 439.
Cardiac Catheterization in Chronic Constrictive Pericarditis. J.-L. Rivier, B. Baudraz and P. Desbaillets.—p. 445.
•Iodine Prophylaxis and Iodine Deficiency Concept: Study of Thyroid Conditions in Children of School Age in Several Swiss Villages. H. J. Wespi.—p. 452.

Iodine Prophylaxis and Iodine Deficiency.—In Wespi's experience, a reduced incidence of goiter is noted earlier in children than in adults. He studied the thyroid of school children in several villages of the Swiss cantons of Zurich and Aargau where examinations carried out in 1912 had shown the incidence of goiter was 55% in the Aargau villages and 47% in the Zurich villages. In 1952 the incidence of goiter had been decreased to 17% in the Aargau villages and to 1% in the Zurich villages. The decrease in the incidence of goiter in the Zurich canton is considered proof of the prophylactic effect of iodized salt, since considerably more iodized salt had been used for seasoning and cooking purposes in the canton of Zurich during the last 20 years than in the canton of Aargau. The reduced incidence of goiter was manifested not only by the disappearance of external evidence of an enlarged thyroid but also by decrease in the number of thyroids that could be palpated. The author agrees with Curtis and Fertman that the human optimal iodine requirement ranges between 100 and 200 mcg. The amount of iodine in the iodized salt used for seasoning and cooking purposes remains within the range of this "biological" dose. The fact that the goiter-preventing effect of the iodized salt is initiated with the biological dose and not only after administration of larger doses clearly demonstrates that the iodine prophylaxis results from prevention of iodine deficiency rather than from a pharmacological effect similar to that of quinine in malaria. Iodine deficiency may result from several causes in man. Primary deficiencies may be due to exogenous factors such as lack of iodine in soil, water, air, and food in regions endemic for goiter. Endogenous factors may be increased requirements in pregnancy and during growth, and climatic, hygienic, and nutritional influences. Secondary deficiencies or disturbances of utilization may be due to disturbances of thyroid hormone synthesis or substances such as fluorine and bromide and of thyroxin-like substances. Heredity may also play a part.

BOOK REVIEWS

1953 Medical Progress: A Review of Medical Advances during 1952. Morris Fishbein, M.D., editor. Cloth. $5. Pp. 301. Blakiston Company (division of Doubleday & Company, Inc.) 575 Madison Ave., New York 22, 1953.

This new publication is a yearbook reviewing recent progress in various branches of medicine and surgery. There are 16 chapters by 24 contributors dealing with special fields and a final chapter in which the editor evaluates important advances. Some chapters begin with a historical account of previous developments to aid the interpretation of current changes; others have only occasional reference to past achievements. Thus the book includes more than a review of the preceding year. There is some overlapping, particularly with regard to drugs, which are mentioned in the chapters dealing with the diseases in which they are employed as well as in a chapter devoted entirely to new and important drugs. All except this chapter and the first and last are followed by a bibliography. The general index could be improved by cross references to synonyms. From chapter to chapter there is no uniformity in drug terminology, which may be confusing to readers not thoroughly familiar with it. Thus hydralazine hydrochloride appears only under the chemical name l-hydrazinophthalazine and the brand name Apresoline, for the base, in the chapter on arterial hypertension. The format and binding of this book are pleasing, and it should be helpful to practicing physicians for reviewing background and current progress in most of the branches of medicine and surgery.

Hoppe-Seyler Handbuch der physiologisch- und pathologisch-chemischen Analyse für Ärzte, Biologen und Chemiker. Herausgegeben von Konrad Lang und Emil Lehnartz, unter Mitarbeit von Günther Siebert. Band V: Unterschung der Organe Körperflüssigkeiten und Ausscheidungen. Bearbeitet von F. Bruns, et al. Tenth edition. Cloth. 168 marks; subscription price, 134.40 marks. Pp. 938, with 44 illustrations, Springer-Verlag, Reichpietschufer 20, (1) Berlin W. 35 (West-Berlin); Neuenheimer Landstrasse 24, Heidelberg; Göttingen, 1953.

The fifth volume (which has preceded the others) of the 10th edition of this standard work deals with the analysis of normal and pathological body fluids, organs, and secretions. It should be welcomed, because the ninth edition is out of print as well as out-of-date, and the corresponding work in English (Peters and Van Slyke, "Quantitative Clinical Chemistry," Vol. 2, Methods) was published in 1932. In typical "Handbuch" fashion, the work is a collection of monographs by experts. Body fluids are covered by K. Hinsberg and his associates, organs by Cremer and Führ, milk by W. Diemair, tumors by C. Dittmar, and drugs and poisons by K. Gemeinhardt. Topics are treated briefly, and the reader is referred to the original literature. The articles cited are in a variety of journals published throughout the world. They date through 1952, although most articles appeared from 1930 to 1950. The material is organized logically. Directions for the assays are short but complete, and the German is simple. There are exhaustive author and subject indexes. Printing, paper and binding are of excellent quality. Clinical chemists, pathologists, and biochemists will find this work worth while.

Functional and Surgical Anatomy of the Hand. By Emanuel B. Kaplan, M.D., F.A.C.S., Assistant Professor of Anatomy, College of Physicians and Surgeons. Columbia University, New York City. Cloth. $10. Pp. 288, with 132 illustrations. J. B. Lippincott Company, 227-231 S. Sixth St., Philadelphia 5; Aldine House, 10-13 Bedford St., London, W.C.2; 2083 Guy St., Montreal, 1953.

It is proper that the hand be considered as an organ, and with this thought in mind the author presents its functional and surgical anatomy. The importance of the hand as a medium through which we are in contact with the surrounding world is stressed. Function is studied along the lines of comparative anatomy, particularly with that of the hands of anthropoid apes. Direct observations revealed that the differences are usually small and at times indistinguishable.

The comparative length of the thumb and the almost constant presence of the flexor pollicis longus is the most characteristic feature of the human hand. This combination permits better opposition and greater stability. The thenar eminence of the gorilla and chimpanzee are almost identical with that of the human hand. For the sake of study, the author has divided the hand artificially into three functional units: the thumb, the index and middle fingers, and the ring and fifth fingers. This is a rather novel and helpful approach. In depicting the thumb as an independent unit, he has incorporated the two phalanges, the first metacarpal, and the greater multangular and navicular bones.

A few minor faults do not seriously detract from this work. There is a lack of illustrations from living material, for example, Dupuytren's contracture shown in figure 120 is that of a shrunken hand of a cadaver. An attempt to make legends clear has resulted in use of too large a size of type. Imbalance between letter size and specimen is seen in figure 61, in which the specimen has been reduced to such a degree that the structures are difficult to identify. The use of color illustrations would have enhanced this text. The book can be recommended to anyone interested in anatomy, function, and surgery of the hand.

The Surgery of Pancreatic Neoplasms. By Rodney Smith, M.S., F.R.C.S., Surgeon, St. George's Hospital, London. Awarded by Council of Royal College of Surgeons the Jacksonian prize for 1951. Cloth. $7. Pp. 157, with 111 illustrations [Williams & Wilkins Company, Mount Royal and Guilford Ave., Baltimore 2]; E. & S. Livingstone, 16 and 17 Teviot Place, Edinburgh 1, 1953.

This concise and well-illustrated book covers most aspects of surgery for tumors of the pancreas. The first section deals with anatomy, physiology, history of pancreatic surgery, and classification of pancreatic neoplasms. The second section thoroughly develops the clinical and surgical aspects of carcinomas of the ampulla of Vater and of the head of the pancreas. The third section deals with less common but interesting and important neoplasms. The author has carefully evaluated the problems connected with diagnosis and surgical treatment. This book will prove valuable reading for surgeons.

Progress in Clinical Medicine. By various authors. Edited by Raymond Daley, M.A., M.D., M.R.C.P., and Henry Miller, M.D., M.R.C.P., D.P.M. Second edition. Cloth. $6.50. Pp. 426, with 43 illustrations. J. & A. Churchill, Ltd., 104 Gloucester Place, Portman Sq., London W.1; [John de Graff, Inc., 64 W. 23rd St., New York 10], 1952.

In the second edition of this book the editors have omitted many of the previous subjects, which were particularly of military interest, and have added sections on cerebral angiography, electrolyte and water balance, cortisone and corticotropin, hypersplenism, toxoplasmosis, electrocardiography, parkinsonism, and the newer antibiotics. In discussing the many aspects and problems of internal medicine no attempt is made to cover complete systems. The material covered should be of general interest to the specialist in internal medicine as well as to the general practitioner or medical student who is at the intern or residency level. The subjects are as well covered as can be expected in a book of this size. There are 43 good illustrations. The style of writing is generally good, and the simplicity of most of the articles makes the volume extremely readable. On the whole, the book can be recommended.

These book reviews have been prepared by competent authorities but do not represent the opinions of any official bodies unless specifically so stated.

CLINICAL MEETING • ST. LOUIS, MO. • DECEMBER 1-4, 1953

QUERIES AND MINOR NOTES

ODOR OF SWIMMING POOL WATER

To the Editor:—*The source of our swimming pool water is a natural hot water well, which provides water of about 87 F with a definite odor of hydrogen sulfide. A chemical analysis of this water revealed manganese, 0, sulfides, 0.1 ppm, nitrate, 0, phosphate as PO_4, 0.14 ppm, silica, 28 ppm, and ammonia as N, 1.0 ppm. It has been discovered that the chlorine demand of this water is 2.2 ppm, but 16 ppm is required to produce a free chlorine residual without chloramine. It is the opinion of a medical committee that this water may contain chemicals that are injurious to the mucous membranes of the nose, throat, and eyes. Inasmuch as we have considerable difficulty with rhinopharyngitis and conjunctivitis in our swimmers, we would like your opinion on the chemical content of the water.*

Warren B. Ross, M.D., Nampa, Idaho

Answer.—The key to this difficulty may reside in the hydrogen sulfide content of the water, which possibly may be appreciably higher than the value reported. This gas potentially is an eye irritant even in trace concentrations. Hydrogen sulfide combines with the added chlorine and thus in part accounts for the high chlorine requirements. This reaction eventuates in a lowered pH, and this acidity may contribute to the eye irritation. The condition might be improved by extensive aeration of the water prior to introduction into the pool. This step will contribute both to removal of the hydrogen sulfide and to acid reduction. From any swimming pool and particularly under circumstances of low temperature, conjunctivitis and nasopharyngitis can arise and not always from either bacterial or chemical contamination. In part this may be related to excessive heat losses from the body. Chiefly this situation is one for the appraisal of the skilled sanitary engineer.

TREATMENT FOR CORAL SNAKE BITE

To the Editor:—*Please outline treatment for the bite of the coral snake (Micrurus).*

Jack Mickley, M.D., Hollywood, Fla.

Answer.—In considering treatment for bites of the coral snake, it must be borne in mind that this reptile is the only representative in America of the family of snakes known as Micruridae, in contrast to the large number in this country that belong to the family Viperidae, which includes rattlesnakes, copperheads, and moccasins. The principal constituent of the venom of Micruridae is a neurotoxin that kills primarily through paralysis of the respiratory center in the medulla. The best known of these venoms is cobra venom, which is now employed therapeutically to some extent. Vipers, on the other hand, produce a venom that is rich in hemotoxins or blood poisons, of which some are hemorrhagins, others are thrombins, which promote blood clotting, and still others are cytotoxic in character. The rational treatment for coral snake bite would of course be the administration of a suitable antivenin, but this consultant is not certain whether such an antivenin is available. If not, the following procedure should be followed: A tourniquet is applied locally to impede further absorption of the venom through the veins and lymphatic vessels. At the same time, with local procaine anesthesia, multiple incisions are made with a razor blade, as much poison as possible is removed by suction, and the wound is irrigated with sodium chloride or potassium permanganate solution. Under no circumstances should permanganate be injected. The tourniquet should be released every 30 minutes to prevent development of gangrene. Mild sedatives, such as phenobarbital or small doses of alcohol, may be administered to relieve pain, and psychotherapy is useful to prevent the patient's becoming panicky. It is not wise to employ morphine or other powerful narcotics, because they depress the respiratory center, which is the most vulnerable organ in coral snake venom poisoning. On the contrary, respiratory stimulants, such as hot coffee or tea, caffeine and sodium benzoate, or pentylenetetrazol (Metrazol), may be administered in severe cases. Artificial respiration may be indicated until the venom is at least partially destroyed in the body. Heart stimulants and other analeptics are administered as necessary. If the occurrence of systemic infection from the bite is possible, cautious use of sulfonamide or antibiotics must be considered. Recent reports of the possible usefulness of antihistaminics and cortisone or corticotropin (ACTH) are not yet convincing but should be borne in mind.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any official bodies unless specifically so stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

LARVA IN INTESTINAL TRACT

To the Editor:—*For some time, a patient has been passing fly-like organisms resembling the drone bee with a long tail. The organism has been described by a pathologist and an entomologist as Tubifera tenax. The condition is apparently rare. If you have any information relative to treatment, we would be pleased to receive it.*

H. F. Hooker, M.D., Danville, Ill.

Answer.—Tubifera tenax is probably the preferred name for a fly of the "rat-tailed larva" group that has been often referred to as Eristalis tenax and occasionally as Eristalomyia tenax. The larva of this fly is not an obligate parasite. It is usually found in water contaminated by sewage and other foul organic matter. The larva, which is extremely resistant to adverse conditions, is apparently able to develop in, and traverse, the gastrointestinal tract. There are on record probably more than 30 cases of human myiasis caused by the larvae of this fly or by the larvae of related species. There are also a number of cases reported in domestic animals.

Treatment for the removal of these larvae has been varied. Among the treatments recorded are jalap, aloe, mild mercurous chloride (calomel), rhubarb, Creolin (a mixture of coal tar phenols and oils) and hot water, santonin, mercury, intestinal antiseptics, and hexylresorcinol. Swartzwelder and Cali (*Am. J. Trop. Med.* **22**:159-163, 1942) mentioned the last-named drug as being given to a child 6 years old, after she had coughed up an insect larva and had passed a small worm after an enema. The dose for the child was three Caprokol (hexylresorcinol) tablets of 0.2 gm. each. It was stated that within a few hours after treatment seven rat-tailed maggots were passed and that some of the larvae were visibly affected by the treatment.

NASAL MEDICATION IN CORONARY PATIENTS

To the Editor:—*Most of the antibiotics for local nasal use embody a vasoconstrictor. Which one is the least harmful medication in cases of coronary sclerosis?*

Max J. Schroeder, M.D., New York.

Answer.—The local use of antibiotics for the control of rhinitis, in the presence of coronary sclerosis, is rarely contraindicated. Even the solutions containing vasoconstrictors in the dilution ordinarily encountered are harmless. Only in extreme instances of coexisting coronary sclerosis and severe hypertension are vasoconstrictors to be used with caution. Even then it is questionable whether such medication elevates blood pressure appreciably or has any adverse influence on the coronary vessels.